ESA Climate Change Initiative

aerosol_cci_bridge

PRODUCT VALIDATION AND INTERCOMPARISON REPORT

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EXECUTIVE SUMMARY

This document evaluates the most recent versions of ESA supported aerosol retrievals for ATSR (SLSTR in future) and MERIS (OLCI in future) sensors, also in comparison to commonly used retrievals for NASA sensors. The focus is on the performance of ATSR retrievals by U. Swansea (v4.32), FMI (ADV v3.11) and RAL (ORAC v4.10) and of MERIS retrievals by IUP (XBAER v.2.3) and DLR (v6.5).

Except for an investigation with level 2 data over China, most evaluations are done with averaged (1x1deg) gridded daily / monthly level 3 averages for AOD - and if provided also for AODf and AODc. The evaluations are done for the year 2008. Reference data-sets are AERONET and CARSNET sun-photometer network data and monthly averages of the MACv2 aerosol climatology, which has been adjusted to include year 2008 specific (by MODIS and MISR indicated) anomalies for AODf and AODc.

The seasonal differences to MACv2 and MISR reveal many deficiencies. And the provided (either retrieved or diagnosed) split into AODf and AODc often reveals even larger problems. A common bias in ATSR retrievals is a too high AODf over oceanic dust outflow regions to cover for missing AODc. Progress could be expected, if most retrieval-groups would revisit assumptions to their applied aerosol models, as for instance fine-mode absorption in ATSR-SU is too weak.

Among the three ATSR retrievals in their current versions of the SU retrieval maintains its top spot - especially with a good performance at lower AOD values. At higher AOD cases the current ATSR-OX has made big improvements.

Among the different MERIS retrievals XBAER and GRASP share the top spot, while the DLR retrieval is at best in a developing phase. Still, even for the better MERIS retrievals, their skill remains clearly below those for ATSR, MODIS, MISR and even SeaWiFS, which has to deal with similar spectral limitations as MERIS.

Almost all retrievals show an overall skill improvement over time. Only the current ATSR-FI seems degraded, but only because the quality filter of the previous version was not applied. Similarly the MODIS c6.1 seems degraded back to the retrieval skill of MODIS c5.0, while MODIS c6.0 retrieval skill was higher. Particular interesting is the reprocessed MISR v32 retrieval, because now most high AOD biases of the older MISR v22 over oceans have disappeared while maintaining a top performer status among tested AOD retrievals over continents.

Overall MISR and ATSR-SU are the top performer for AOD retrievals (The better global combination score of ATSR-SU is attributed to the poor MISR performance over polar regions). Still many AOD retrieval biases remain.

To find reasons for apparent AOD retrieval biases, it was demonstrated that information on AODf and AODc was very useful. In addition, also (not necessarily retrieved) information on aerosol absorption assumptions for both fine-mode (AAODf) and coarse mode (AAODc) would is needed to address fine-mode absorption bias and coarse mode aerosol size bias. For all four aerosol optical properties (AODf, AODc, AAODf and AAODc) reference data exist, either from sun-/sky-data of AERONET or from output of AOD constrained aerosol component models.

Document change record

Issue	**Date**	**Modified Items / Reason for Change**
4.0	15.11.2018	First draft of the document (with figures and tables)
4.1	24.11.2018	First complete version (with interpretation)
	26.11.2018	Review, minor layout / spelling corrections by science leader
4.2	09.01.2019	Minor corrections after review by ESA (esp. table 7.1)

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1 DEFINITIONS AND ABBREVIATIONS

This section summarizes the major definitions relevant for the validation report.

AAOD (Absorption Aerosol Optical Depth) is the vertically normalized atmospheric column integrated aerosol absorption at a certain wavelength (usually at 550 nm, the reference wavelength in global modelling) [note, AAOD = AOD*(1-SSA)]

AeroCom is an open science initiative founded to inter-compare aerosol modules in global modelling and evaluate overall model performance as well as the treatment of specific aerosol processes against available (and trusted) observations.

AERONET represents a federated network of globally distributed ground-based CIMEL sun-/sky-photometers, which is maintained (calibration facility, data processing and aerosol and water vapor products access) by NASA (National Aeronautics and Space Administration) and PHOTONS (PHOtométrie pour le Traitement Opérationnel de Normalisation Satellitaire)

AOD (Aerosol Optical Depth) is the vertically normalized atmospheric column integrated aerosol extinction at a certain wavelength or waveband (usually at 550nm, the reference wavelength in modelling). AOD is also often referred to as Aerosol Optical Thickness (AOT).

ATSR (Along Track Scanning Radiometer) was a multi-channel imaging radiometer (with dual view capabilities in the visible and near-IR solar spectrum). Two versions are used for aerosol retrieval: ATSR-2 on board of the European Space Agency's ERS-2 satellite (1995-2002) and the advanced ATSR (AATSR) on ESA's ENVISAT satellite (2002-2012).

CALIOP (Cloud-Aerosol Lidar with Orthogonal Polarization) is a two-wavelength polarization-sensitive backscatter lidar that provides high-resolution vertical profiles of aerosols and clouds onboard NASA's CALIPSO satellite.

CF (Climate and Forecast) naming convention metadata are designed to promote the processing and sharing of files created with the NetCDF API.

CMUG (Climate Model User Group) is a part of ESA's Climate Change Initiative (CCI) and is composed of members of major climate research institutes in Europe. The group is tasked to oversee the usefulness of new climate data records produced for CCI selected ECVs.

ECV (Essential Climate Variables) are geo-physical quantities of the Earth-Atmosphere-System that are technically and economically feasible for systematic (climate) observations.

ENVISAT ("Environmental Satellite") is a now inoperative ESA polar-orbiting (ca 10am local overpass) satellite, which supplied between 2002 and 2012 atmospheric data, including for aerosol remote sensing relevant AATSR, MERIS and GOMOS sensor data.

FCDR (Fundamental Climate Data Records or simply **CDR**) represent long-term records of measurements or retrieved physical quantities from remote sensing. FCDRs require consistency across multiple platforms with respect to (1) calibration, (2) algorithms, (3) spatial and temporal resolution, (4) quantification of errors and biases and (5) data format. FCDRs also need to manifest applied ancillary data.

FMF (Fine Mode Fraction) is the fraction of the total AOD which is contributed by aerosol particles smaller than 1µm in diameter. Due to their smaller size these aerosol particles are referred to as fine-mode aerosol, in contrast to larger or coarse model aerosol particles.

GCOS (Global Climate Observing System), located at WMO in Geneve, is intended to be a long-term, user-driven operational system capable of providing the comprehensive observations required for (1) monitoring the climate system, (2) detecting and attributing climate change, (3) assessing impacts of, and supporting adaptation to, climate variability and change, (4) application to national economic development and (5) research to improve understanding, modelling and prediction of the climate system.

GOMOS (Global Ozone Monitoring by Occultation of Stars) is an instrument on board the European satellite ENVISAT. The main scientific objective of this stellar occultation instrument is to monitor ozone and ozone trends as function of altitude in the upper atmosphere (stratosphere, mesosphere). GOMOS also measures atmospheric parameters related to (stratospheric ozone) chemistry like NO2, NO3, H2O and aerosol as well as ozone dynamics like temperature, air density and turbulence.

IASI (Infrared Atmospheric Sounding Interferometer) on European MetOp platforms senses the thermal heat emission from the Earth (with a Michelson interferometer) mainly to provide atmospheric temperature and humidity profiles.

ICAP (International Cooperative for Aerosol Prediction) is an international forum for aerosol forecast centers, remote sensing data providers, and lead systems developers to share best practices and discuss pressing issues facing the operational aerosol community.

MACC (Monitoring Atmospheric Composition and Climate) were EU-funded projects for the development of a chemical weather forecast service. Now in its operational phase, **Copernicus** predicts global distributions and long-range transports of greenhouse gases (carbon dioxide, methane), of aerosols that result from both natural processes and human activities and of reactive gases (tropospheric ozone, nitrogen dioxide). **Copernicus** also evaluates how these constituents influence climate and estimates their sources and sinks.

MAN (Marine Aerosol Network) is the ocean branch of the AERONET network, based on handheld solar attenuation measurements with calibrated MICROTOPS-II sun-photometers.

MERIS (MEdium Resolution Imaging Spectrometer) was one of the main spectrometers on board the European Space Agency (ESA)'s Envisat platform.

MISR (Multi-angle Imaging Spectro-Radiometer) is a multi-spectral sensor on NASA’s EOS Terra platform with (9) multi-directional view capabilities.

MODIS (Moderate Resolution Imaging Spectro-Radiometer) is a multi-spectral sensor on NASA's EOS Terra and Aqua platforms.
OLCI (Ocean and Land Color Instrument) on Sentinal 3 is based on the opto-mechanical and imaging design of ENVISAT's MERIS instrument.

OMI (Ozone Monitoring Instrument) is a UV multi-spectral sensor on NASA's EOS Aura platform.

POLDER (POLarization and Directionality of the Earth's Reflectances) is a passive optical imaging radiometer and polarimeter for studies on radiative and microphysical properties of clouds and aerosols on the French CNES PARASOL (Polarization and Anisotropy of Reflectances for Atmospheric Sciences coupled with Observations from a Lidar).

SCIAMACHY (Scanning Imaging Absorption Spectrometer for Atmospheric ChartographY) was a high spectral resolution passive sensor (in the UV and the visible solar spectral region) with both nadir and limb measurement capabilities on the ESA's ENVISAT platform.

SENTINEL The **Sentinel** satellite provide Earth Observations from space as part of ESA's Copernicus program, formerly GMES (Global Monitoring for Environment and Security)

SLSTR The SLSTR instrument on SENTINEL-3 maintains the continuity with the (A)ATSR series of instruments. The design supports the basic functionality of AATSR, with the addition of a wider swath, new channels dedicated to fire detection.

SSA (Single Scattering Albedo) quantifies the likelihood of scattering during an attenuation (or 'extinction') event by an atmospheric particle of given size and shape at a certain wavelength (most important at 550 nm, the reference wavelength in global modeling). The remaining fraction, 1-SSA referred to co-single scattering albedo, quantifies the likelihood of absorption during an attenuation (or extinction) event.

2 INTRODUCTION

ESA's aerosol CCI effort supported aerosol retrieval development, so that for European sensors new retrieval algorithms could be developed or already existing retrievals could be improved. This evaluation here focuses on the most recent ATSR and MERIS retrieval efforts, also as a guide in selecting those retrievals that will be chosen to continue the past ATSR and MERIS (ENIVISAT) data-records with SLSTR and OLCI sensors on the new Copernicus Sentinel-3 platforms.

Several approaches are applied to address retrieval skill or failure. Focusing on year 2008 retrieval data, different data references have been applied. The preferred reference are highly accurate data (but globally uneven distributed) sun-photometer data. While most of these sun-photometer references are based on AERONET and (oceanic-) MAN network data, one evaluation study with focus on retrievals over China was allowed to apply CARSNET data. The other major reference is the MACv2 aerosol climatology for 2008. This MACv2 aerosol climatology extends multi-year monthly statistics for AERONET and MAN with spatial context from detailed aerosol component modeling. And the associations to the year 2008 is done by imposing year 2008 AOD anomalies according to MODIS and MISR 2001-2016 data records separately for fine-mode AOD (AODf) and coarse-mode AOD (AODc) contributions. This climatology offers reference data not just for amount (i.e. AOD) but also for other important (and in retrievals often assumed) aerosol properties of size (i.e. AODf, AODc) and absorption (i.e. AAOD) and even more importantly has globally complete coverage. In addition, also comparisons to mature retrievals are offered, in particular to the recent MISR v32 retrieval.

First annual average maps for the mid-visible AOD of available aerosol retrievals for the year 2008 are compared for a more general comparison of differences in values and coverage. Then global maps of available reference data are introduced before seasonal difference maps of all test-data to these references are shown to deduce seasonal and regional biases. Hereby not only seasonal difference maps for total AOD are presented but also for AODf and AODc - and even AAOD. The added information is not always retrieved and provides added insights on AOD biases or offsetting AODf and AODc biases.

Then statistical methods are applied. First, AOD case statistics to site data over the greater China region is examined. Then, monthly worldwide AOD and AODf site statistics is explored. Finally. rank based scores against daily AOD, AODc and AODf site averages as well as against monthly AOD, AODc and AODf statistics regionally and globally are determined and ranked according to the assigned combination score.

For comparison purposes the statistical evaluations of other common used aerosol retrievals are included and also the statistical performances of older retrieval versions are included to demonstrate progress.

3 OVERVIEW

For an initial impression year 2008 global maps of annual averages of evaluated retrievals for (A)ATSR and MERIS are compared to each other and in the context of existing data-set of NASA retrievals in Figure 3.1 (with associated labels explained in Table 3.1).

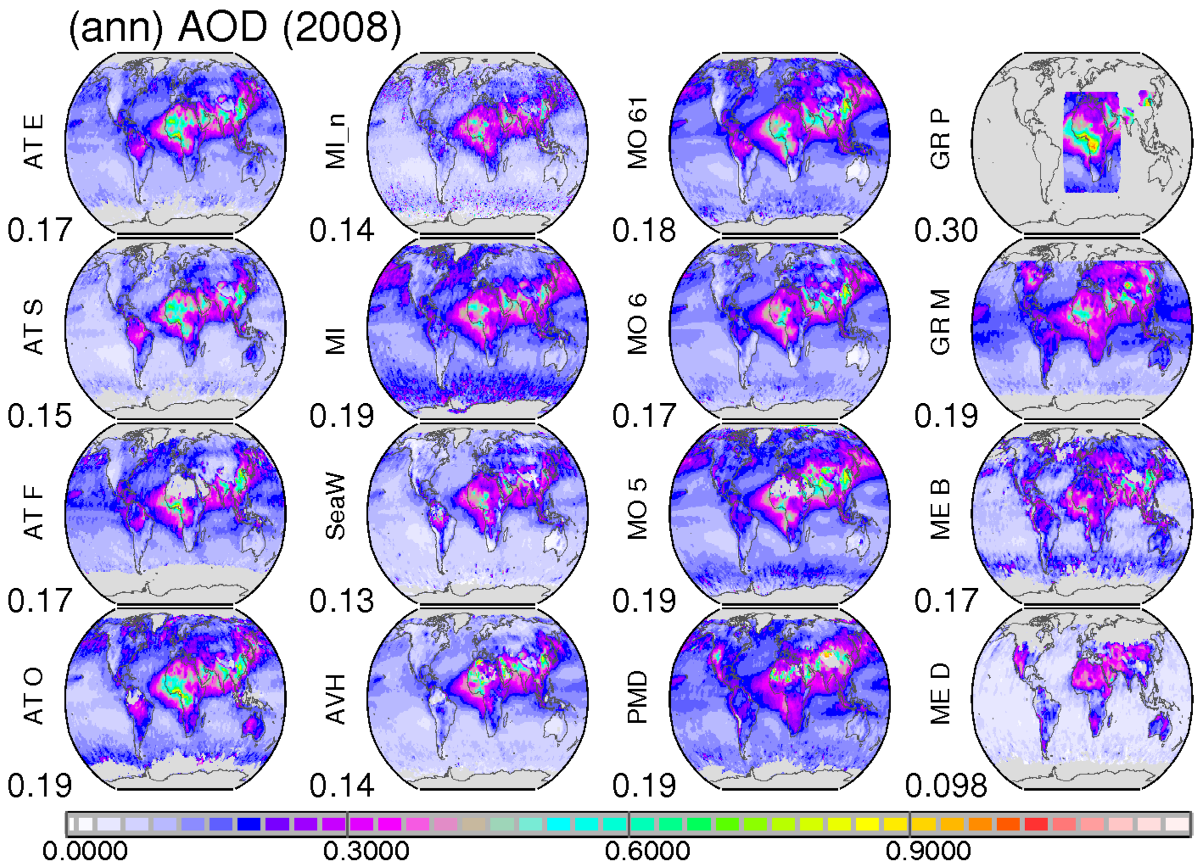

Figure 3.1 *comparison of global maps for year 2008 annual averages for mid-visible (550nm) AOD data for the most recent versions of ATSR and MERIS retrievals in comparison to different retrievals for US satellite sensors – including those for different MODIS and MISR version. Applied labels are summarized in Table 1. Values below the labels indicate global averages.*

Table 3.1 *label for tested retrievals*

label	***retrieval version***	***group***	*label*	***retrieval version***	***group***
ATE	ATSR ensemble	DLR, Munich	**MI_n**	MISR v2.3	NASA JPL
ATS	ATSR SU 4.32	Swansea	**MI**	MISR v2.2	NASA JPL
ATF	ATSR ADV 3.11	FMI, Helsinki	**SeaW**	SeaWiFS	NASA, GSFC
ATO	ATSR OX 4.10	RAL, Harwell	**AVH**	AVHRR	NASA, GSFC
GR P	GRASP Polder	LOA, Lille	**MO 61**	MODIS c6.1	NASA, GSFC
GR M	GRASP Meris	LOA, Lille	**MO 6**	MODIS c6.0	NASA, GSFC
ME B	MERIS XBEAR 2.3	IUP, Bremen	**MO 5**	MODIS c5.0	NASA, GSFC
ME D	MERIS DLR 6.2	DLR, Munich	**PMD**	PMAp	EUMETSAT

4 REFERENCES

Five global reference data-sets have been selected. Aside from high accuracy sun-/sky-photometer data at globally unevenly distributed sites (AERONET and MAN) also four data-sets with lower accuracy but better global coverage were selected. These include more mature satellite retrievals (MISR v3.2 and MODIS c6.1) and climatologies based on MACv2.

AERONET/MAN offers high quality data on aerosol column properties via measurements of solar radiation at cloud-free conditions. Direct solar attenuation data provide highly accurate data of AOD at different solar wavelengths so that even mid-visible (550nm) AOD attributions to (1) super-micron size (coarse-mode) aerosol (AODc) as by mineral dust and sea-salt and to (2) sub-micron size (fine-mode) aerosol (AODf) as by pollution and wildfires can be assigned. Particular informative are complementary sky-radiance samples (at more than 400 AERONET continental of island sites worldwide) which in combination with direct attenuation data provide detailed information on aerosol size (22 bin size-distributions) and on aerosol composition (refractive indices and thus SSA). While most AERONET sites have good data coverage over all seasons, the site distribution over land is highly uneven and often missing in important regions. This also includes China, where actually existing sun-photometer data of CARSNET are not openly shared. Fortunately a Chinese co-laboration produced evaluation results with CARSNET data over the larger China region. To address oceanic references, the MAN group offers data of about 200 research voyages over the last decade. The spatial unevenness is illustrated for AERONET/MAN averages for AOD, AAOD, AODf and fine-mode effective radius (REf) in Figure 4.1.

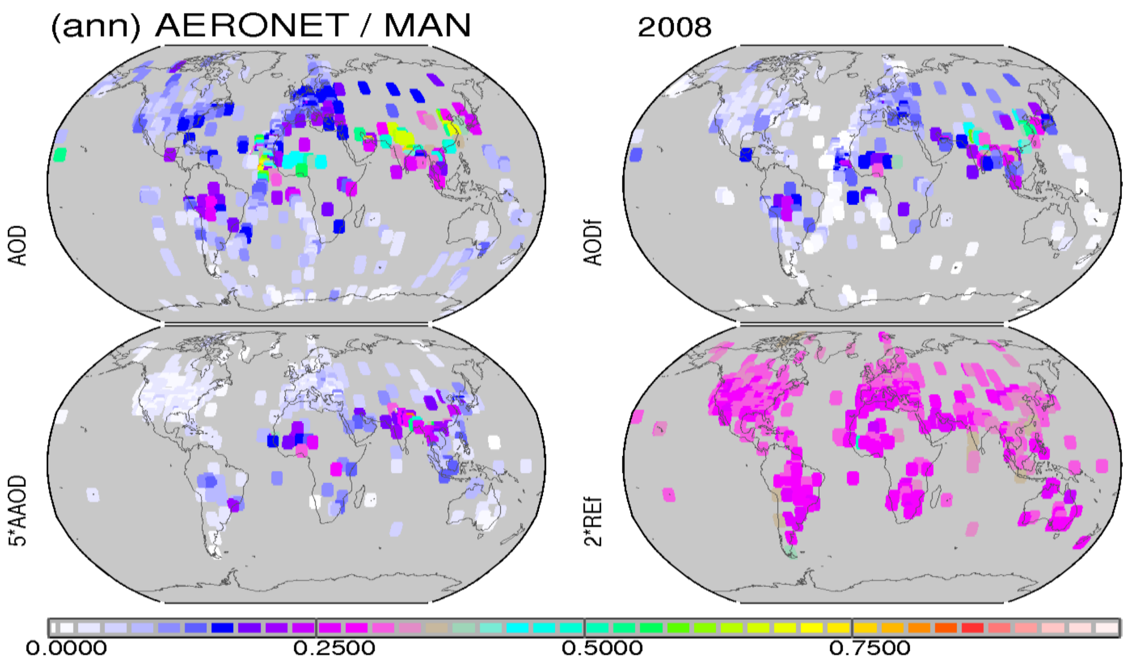

***Figure 4.1** AERONET/MAN annual averages for mid-visible column amount (AOD, upper left), for aerosol absorption (AAOD, lower left, multiplied by 5), for mid-visible AOD of sub-micrometer aerosol*

sizes (AODf, upper right) and for effective diameter of sub-micrometer sizes (lower right, 2 times the effective radius). AOD and AODf have a better data-coverage due to MAN coverage over oceans.

MISR offers advanced aerosol retrievals with its multi-spectral and multi-viewing capabilities. In past retrieval comparisons, the older MISR v22 AOD retrieval was a top performer over continents but displayed a strong AOD high bias over oceans. In the new MISR v32 retrieval not only pixel resolution was improved but also the ocean bias was largely removed. Still, MISR has limited spatial daily coverage and its monthly statistics (even at 1x1 degree spatial resolution) is poor compared to polar orbiting satellite sensors with a wider swath. Thus, only larger differences that are consistent over larger regions should be discussed in more detail. AODf is here represented by MISR assigned AOD to small aerosol sizes, AODc represents the MISR assigned AOD to mid and larger aerosol sizes and AODdu refers to MISR assigned AOD to non-spherical aerosol. Annual MISR maps for year 2008 mid-visible total AOD, fine-mode AOD (AODf), coarse-mode AOD (AODc) and dust AOD (AODdust) and corresponding seasonal maps are presented in Figure 4.2.

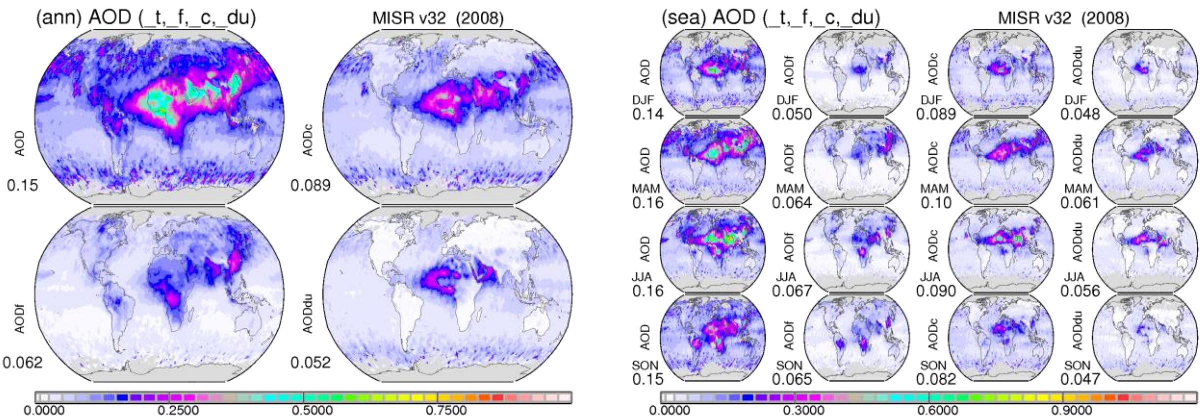

Figure 4.2 *MISR v32 annual (left) and seasonal (right) maps for year 2008 AOD, AODf, AODc and AOD_dust. Due to poor statistics the displayed MISR data over some regions are occasionally rather noisy. Values below the labels indicate global averages.*

MODIS is the most widely used satellite sensor based aerosol product data-set (e.g. AOD, fire counts), (1) as global coverage (with at least two daytime overpasses) is among the best (an important element in data assimilations), (2) the retrieval (improved over two decades) has reached a higher level of maturity and (3) its retrieval data can be relatively easy accessed. As retrieval over brighter (land) surfaces remain difficult, there appears (despite of pulling information from two different [deep blue and dark target] approaches) a tendency to overestimate AOD over continents. In this study MODIS aerosol data of the most recent collection 6.1 processing are applied. As data for AODf in that processing are (officially) only offered oceans, AODf estimates for MODIS over land were added based on a method by P.Ginoux were added, which also provides AODdu estimates over continents. AODc is simply defined by the difference: AOD minus AODf. Annual MODIS maps for year 2008 mid-visible total AOD, fine-mode AOD (AODf), coarse-mode AOD (AODc) and dust AOD (AODdust) and corresponding seasonal maps are presented in Figure 4.3.

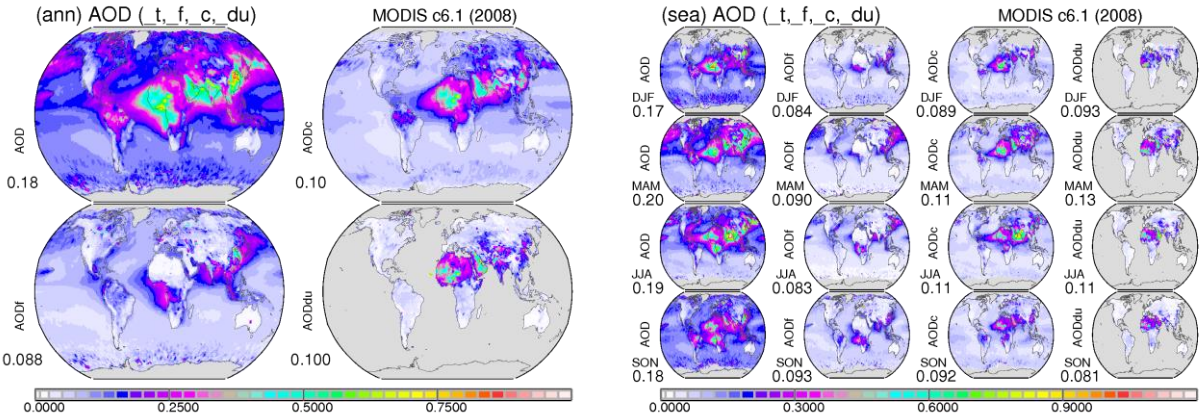

Figure 4.3 *MODIS c6.1 annual (left) and seasonal (right) maps for year 2008 AOD, AODf, AODc and AOD_dust. Values below the labels indicate global averages.*

MACv2 is a monthly aerosol climatology with global coverage for all aerosol properties of amount, size and absorption by combining trusted local monthly statistics of sun-/sky-photometry for years ranging from 1998 to 2015 with spatial context provided by modeling. Hereby, applied modeling maps are represented by an ensemble median of aerosol component global (AeroCom) simulations with current emissions. The merged optical properties address mid-visible aerosol properties of amount (AOD) and absorption (AAOD) along with a separation of these properties associated with sub-micrometer (AODf, AAODf) and super-micrometer aerosol sizes (AODc, AAODc). Annual and seasonal MACv2 maps for mid-visible AOD, fine-mode AOD (AODf), coarse-mode AOD (AODc) and dust AOD (AODdust) and corresponding seasonal maps are presented in Figure 4.4.

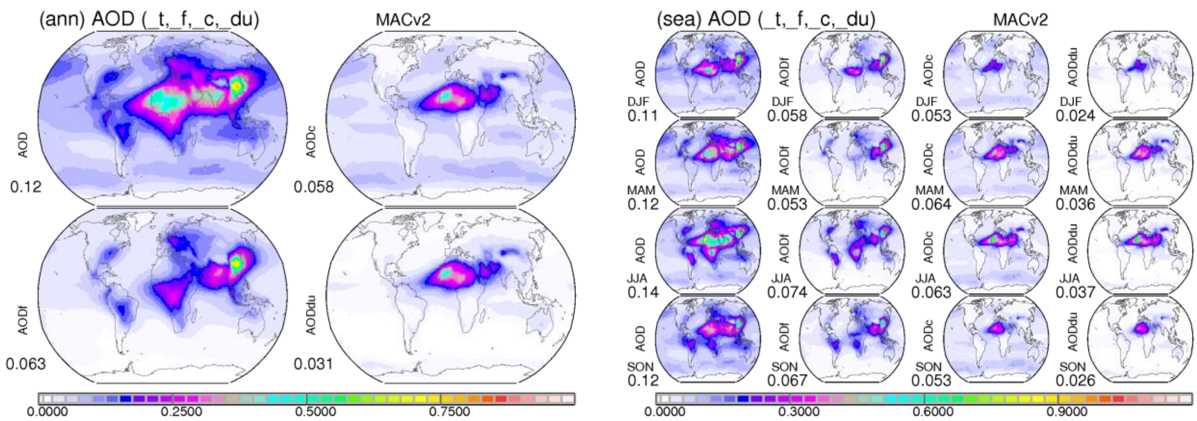

Figure 4.4 *MACv2 annual (left) and seasonal (right) maps for mid-visible aerosol column properties of AOD, AODf (fine-mode only), AODc (coarse-mode only) and AOD for mineral dust. Values below the labels indicate global averages.*

As aerosol absorption is quite relevant for aerosol retrievals, MACv2 seasonal absorption potential for fine-mode (SSAf) and coarse mode aerosol (SSAc) is presented Figure 4.5.

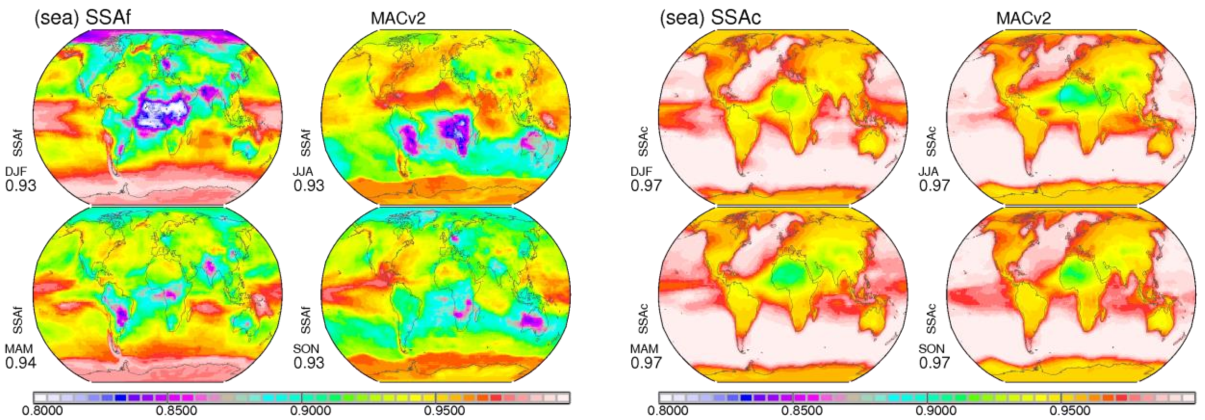

Figure 4.5 *MACv2 seasonal maps for mid-visible absorption potential for sub-micrometer aerosol sizes (SSAf, left) and super-micrometer aerosol sizes (SSAc, right). Global averages below the labels are less meaningful, because they are not AOD weighted.*

The MACv2 reference offers complete global coverage for all relevant aerosol properties in a consistent way. However, year specific anomalies are not considered. To correct for that bias a 2008 year specific MACv2_08 aerosol climatology was developed. In the MACv2 version for the year 2008 (MACv2_08) year 2008 anomalies are included based on multi-annual retrieval records by MODIS and MISR. Hereby locally for each month scaling factors are applied based on the ratio of the 2008 value to the multi-annual (2001-2016) average. After local smoothing (especially for sparser MISR data) the average scaling factor of MODIS and MISR is applied. Annual and seasonal MACv2_08 maps for mid-visible AOD, fine-mode AOD (AODf), coarse-mode AOD (AODc) and dust AOD (AODdu) are presented in Figure 4.6.

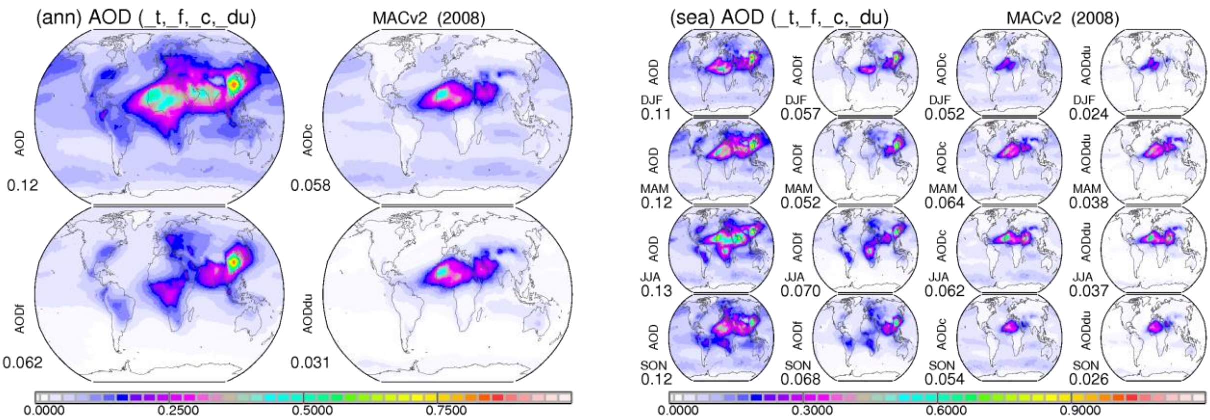

Figure 4.6 *MACv2_08 year 2008 annual (left) and seasonal (right) maps for mid-visible aerosol column properties of AOD, AODf (fine-mode), AODc (coarse-mode) and AODdu (mineral dust). Values below the labels indicate global averages.*

In sub-sequent evaluations, the year 2008 (daily) AERONET / MAN data and the (monthly) MACv2_08 climatology are applied as the the primary references.

5 TEST- DATA

ESA supported retrievals for ATSR sensor data (ATSR_SU 4.32, ATSR_FI 3.11, ATSR_OX 4.10) and retrievals for MERIS sensor data (MERIS_XB 2.3, MERIS_DL 6.5) are evaluated. These retrievals are of interest as there are now follow-on sensors of SLSTR and of OLCI on new Copernicus Sentinel-3 platforms with at least the same capabilities of the older sensors, so that the ENVISAT data-records can be continued. Both sensor groups are multi-spectral in nature. The ATSR/SLSTR sensors have IR-spectral channel (desirable for cloud detection) and multi-viewing capabilities (for more accurate land retrievals) but they have a relatively narrow swath (thus a ca once every four day revisit rate). The MERIS/OLCI sensors, on the other hand, have a wider swath (of almost daily revisits) but they lack IR channels and multi-view capabilities. First, the test-data are presented, also in the context of previous versions and in the context of NASA retrievals (e.g. MODIS, MISR, SeaWiFS, AVHRR). Then differences to reference data with global coverage are presented and finally the statistical performance is quantified in scores.

ATSR-SU is the retrieval of the Swansea University. Seasonal AOD maps in Figure 5.1 capture the development of the AOD retrieval over time - from version 3.0 via versions 4.0 and 4.21 to current version 4.32. Seasonal maps in Figure 5.1 also illustrate for the current retrieval the seasonal AOD split into fine-mode (AODf) and coarse mode (AODc).

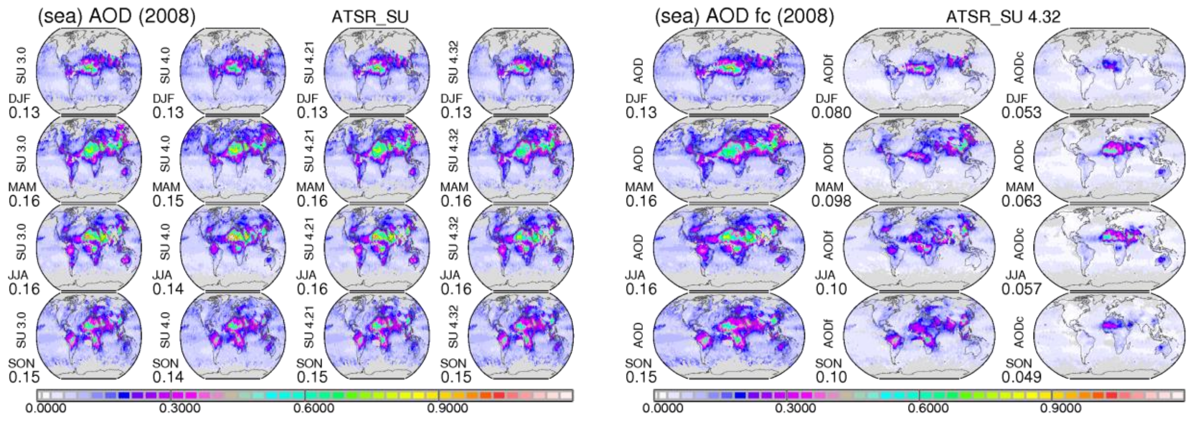

Figure 5.1 *ATSR-SU seasonal maps for AOD for versions 3.0, 4.0, 4.21 and the current version 4.32 (left) and the AOD split into fine-mode AODf and coarse-mode AODc (right). Values below the labels indicate global averages.*

The relative stong AOD values over the central Sahara region are more moderate in the current version. There, the relatively large AOD values are mainly caused by **large fine-mode AOD contributions**. In that context, fine-mode AOD contributions are relatively high (as if fine-mode absorption is underestimated).

ATSR-FI is the ADV retrieval of FMI, Helsinki. Seasonal AOD maps in Figure 5.2 capture the development of the AOD retrieval over time - from version 1.42 via versions 2.3 and 2.3 plume-quality to current version 3.11. Seasonal maps in Figure 5.2 also illustrate for the current retrieval the seasonal AOD split into fine-mode (AODf) and coarse mode (AODc).

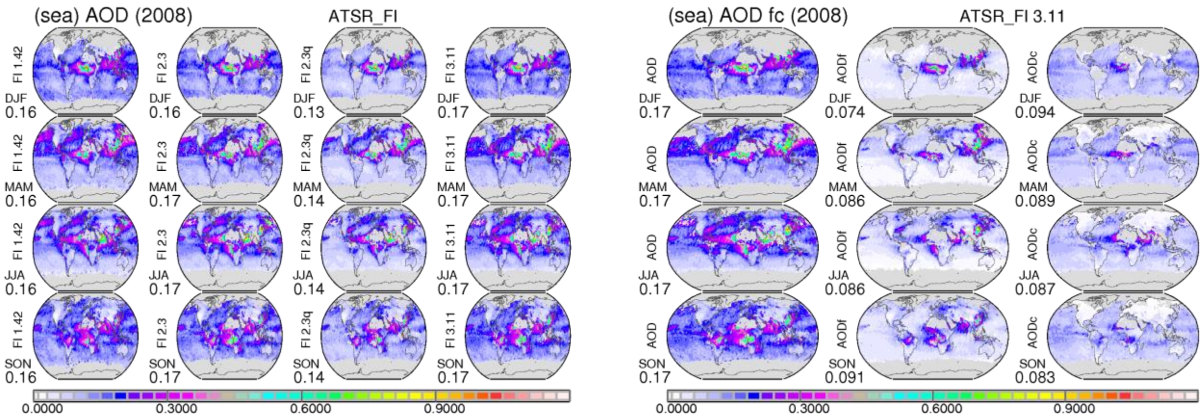

Figure 5.2 *ATSR-FI seasonal maps for AOD for versions 1.42, 2.3, 2.3q and the current version 3.11 (left) and the AOD split into fine-mode AODf and coarse-mode AODc (right). Values below the labels indicate global averages.*

The current retrieval – compared to the 2.3 quality retrieval – is back to larger AOD values, mainly due to larger background values over oceans (as if the cloud-free detection criteria got relaxed). This is mainly caused by relatively large coarse-mode AOD contributions –even though this retrieval does not report over bright surfaces. Also the fine-mode AOD appears high - especially over oceans.

ATSR-OX is the retrieval of the RAL/Oxford. Seasonal AOD maps in Figure 5.3 capture the development of the AOD retrieval over time - from version 2.02 via versions 3.02 and 4.01 to current version 4.10. Seasonal maps in Figure 5.3 also illustrate for the current retrieval the seasonal AOD split into fine-mode (AODf) and coarse mode (AODc).

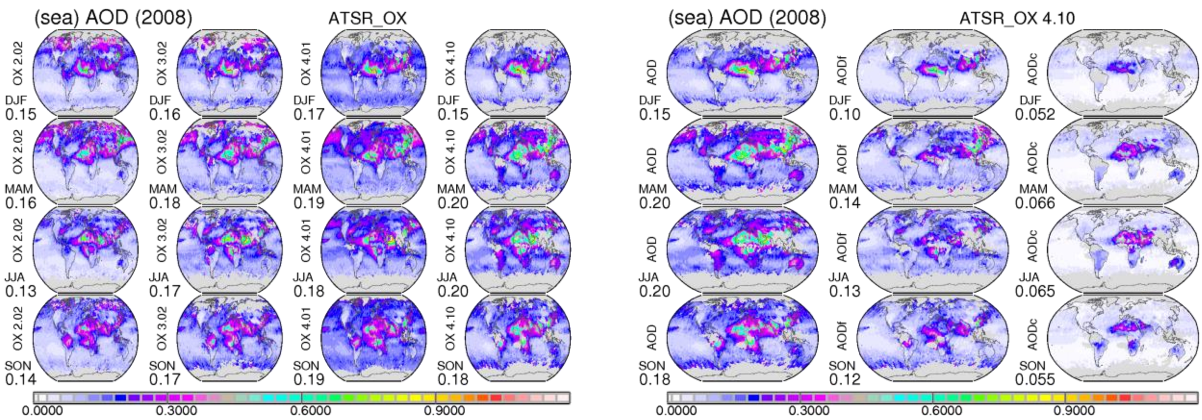

Figure 5.3 *ATSR-OX seasonal maps for AOD for versions 2.02, 3.02, 4.01 and the current version 4.10 (left) and the current AOD split into fine-mode AODf and coarse-mode AODc (right). Values below the labels indicate global averages.*

In the current version the high NH latitude AOD biases are reduced. Compared to the previous version the oceanic background is lowered but fine mode AOD is increased almost twice as large as expectations. As in ATSR-FI, ATSR-OX displays unexpectedly large AODf contributions over dust dominated regions.

MERIS-XBAER and **MERIS-DLR** are new algorithms developed at IUP Bremen (XBAER) and at DLR with the goal of a SeaWiFS like retrieval skill (DLR). AOD maps for seasonal months (Dec, Mar, Jun, Sep) in Figure 5.4 compare the development of the AOD retrieval of the XBEAR retrieval over time - from version 1.1 via versions 2.0 and 2.1 to current version 2.3. Maps of seasonal months in Figure 5.4 also compare AOD MERIS retrievals of XBEAR and DLR to those of MERIS-GRASP and to SeaWIFS retrievals for the same year 2008.

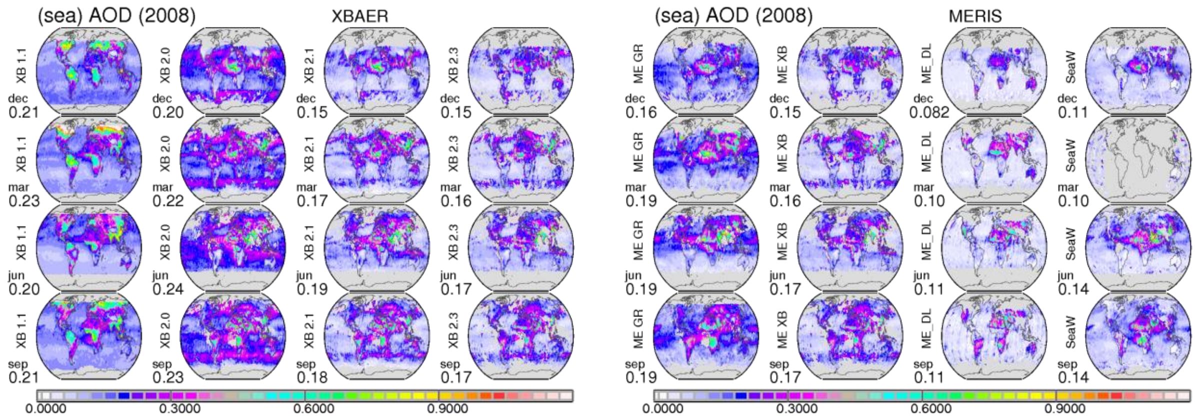

Figure 5.4 *MERIS-XBEAR seasonal maps for AOD for versions 1.1, 2.0, 2.1 and the current version 2.3 and seasonal month AOD maps for the most recent MERIS XBEAR version 2.3, MERIS-GRASP, MERIS-DLR version 6.5 and SeaWiFS (right). Values below the labels indicate global averages.*

In the current XBAER version, the AOD overestimates over continents in version 1.1, over oceans in version 2.0 and some continental regions in version 2.1 have largely disappeared and there are now clear similarities to MERIS-GRASP, which in peak AOD and in oceanic AOD values is higher (including a very strong plume off Hawaii in SW direction). The DLR retrieval is still in its devloping stage with unexplainable high biases (e.g. western US). Also the AOD values over oceans are very low, which contributes to a strong land-sea contrast.

6 DIFFERENCES

Differences of the test-data to global reference data (of MACv2_08 and MISR) are shown to identify regions and seasons of larger differences. In the initial overview of difference for the mid-visible AOD of Figure 6.1 also data of other available AOD retrievals (those shown in Figure 3.1) are included for comparison.

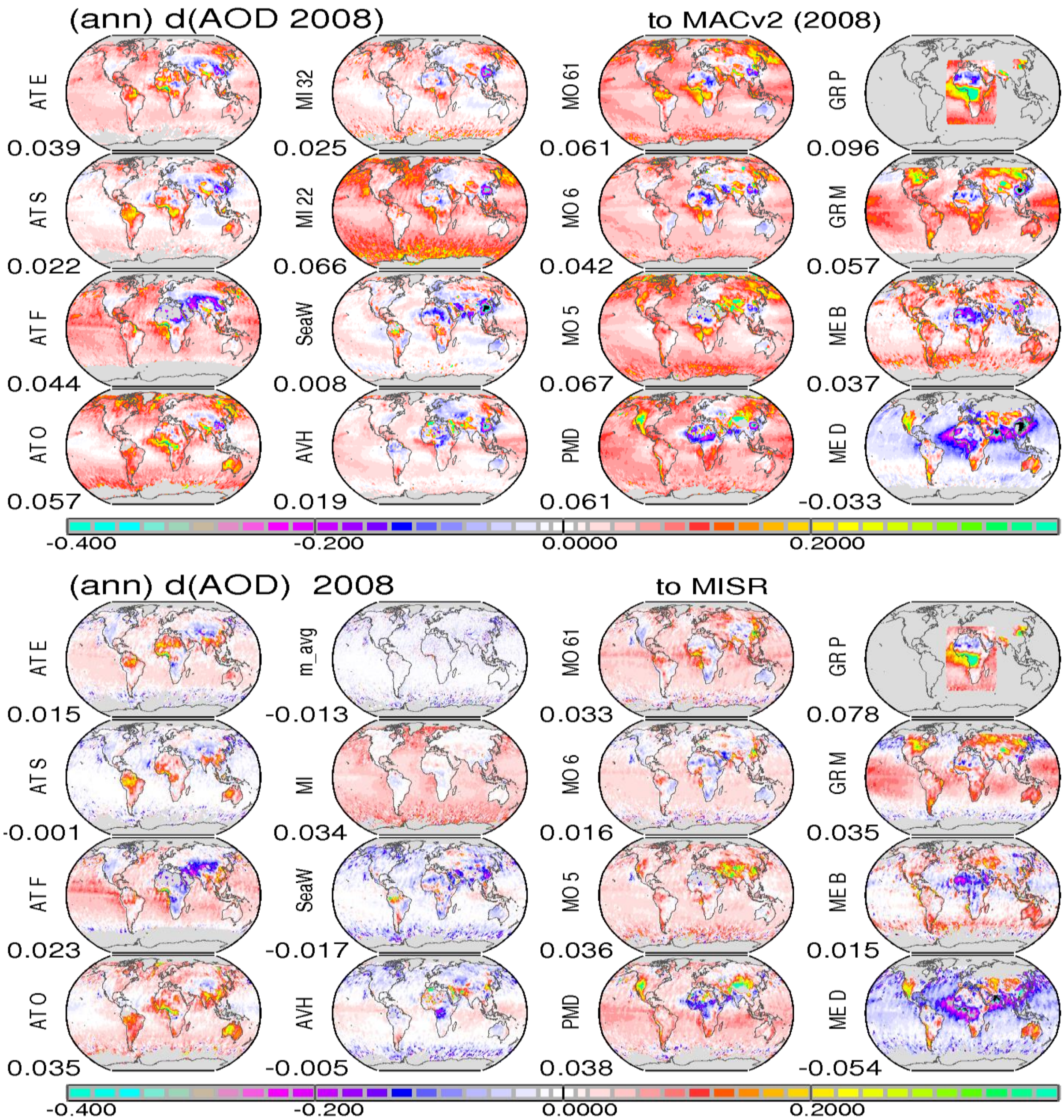

Figure 6.1 *annual year 2008 AOD differences of the test data presented in Figure 3.1 with respect to MACv2_08 (top) and MISR (bottom). Red colors indicate likely overestimates and blue colors suggest underestimates (the 'm-avg' in the bottom block displays uncertainties from differences in averaging). Values below the labels indicate global annual averages of differences.*

A lack in color in Figure 6.1 is desirable, as red (and more so yellow and green) suggest overestimates for AOD retrievals and as blue (and more so purple and light blue and black) suggest AOD underestimates. For the 2008 annual average the two reference data sets of MACv2_08 and MISR indicate a consistent picture on biases, as summarized in Table 6.1

***Table 6.1** apparent bias in annual AOD of most recent retrievals (based on 2008 retrieval statistics)*

	regions with overestimate	***regions with underestimates***
ATSR-SU v4.32	biomass, N.India, west Australia	
ATSR-FI v3.11	ocean (esp. tropics), N.India	land regions with dust
ATSR-OX v4.10	at arctic, biomass, N.India, W.Aust	
MISR v32	higher latitudes, Congo (biomass)	
MODIS c6.1	biomass (incl Siberia), oceans	
AVHRR	Arabia	
SeaWiFS	central S.America (biomass)	land (dust) regions, China (pollution)
GRASP-Polder	west Africa / Congu (biomass)	Sahara
GRASP-Meris	NH high latitude continents,	Asian outflow on Pacific (poll./dust))
ME-XBEAR v2.3	mid-latitude oceans	dust belt (sahara to Asia)
ME-DLR v6.5	West US, Australia, central Asia	all oceans

The common AOD underestimate over China with respect the the MACv2_08 climatology suggests that the MACv2_08 climatology for the year 2008 is biased high over China. For MISR, the deviation comparisons show, that the high AOD bias of the older MISR retrieval over oceans is now removed and that also some high biases (e.g. N.India) over land are reduced. For MODIS the most recent collection 6.1 falls back on the skill level of collection 5. Since collection 6.0 seems much better, it is suspected that some of the quality flags for the presented collection 6.1 version were not applied.
For more background on the test-data deviations seasonal difference not only to AOD but also to assigned AODf and AODc are examined (next).

ATSR-SU seasonal AOD difference maps with respect to MACv2_08 and MISR.

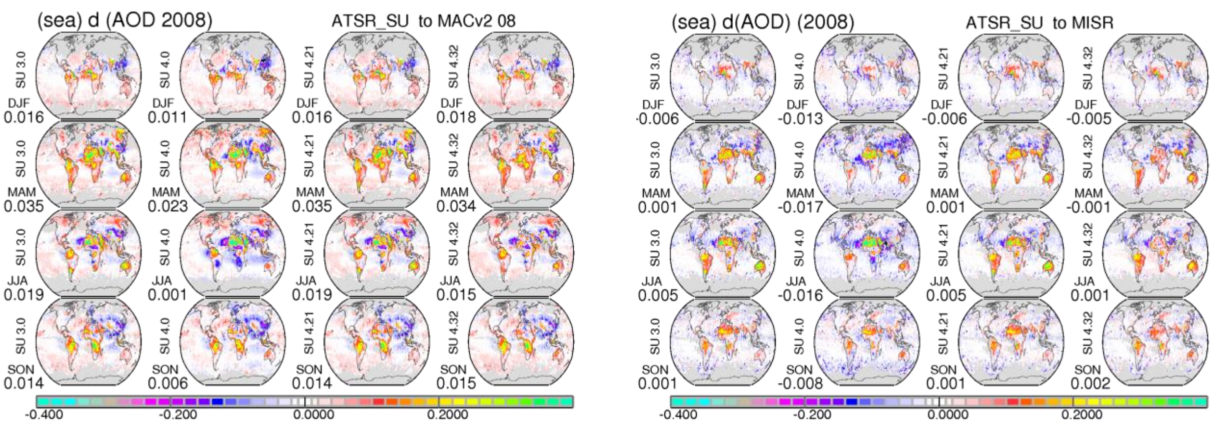

Figure 6.2 *seasonal year 2008 AOD differences for different ATSR-SU versions with respect to MACv2_08 (left) and MISR (right). The most recent retrieval is shown in the right column. Red colors indicate overestimates and blue colors underestimates. Values below labels are average differences.*

Compared to the older ATSR versions, in the most recent version the spring and summer AOD overstimates over the Sahara region are reduced. AOD overestimates persist over regions/seasons with strongly absorbing aerosol (e.g. over biomass regions).

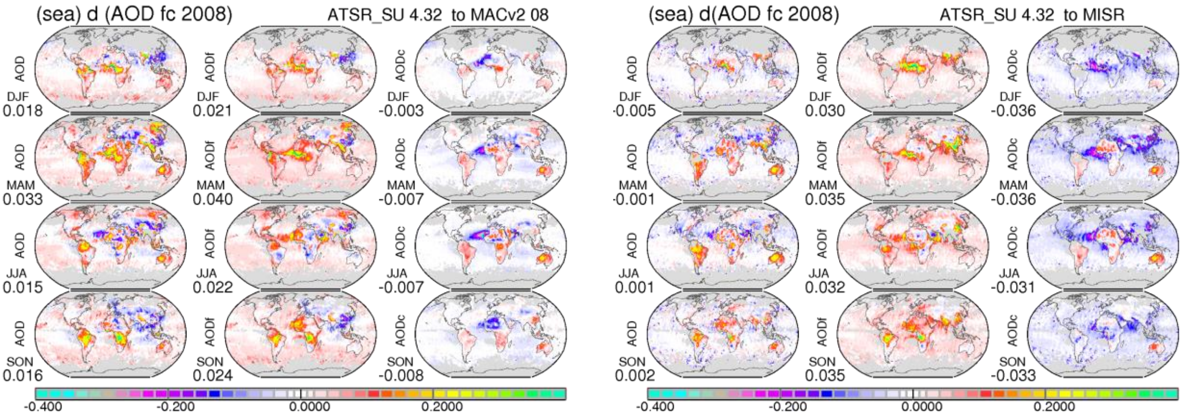

Figure 6.3 *seasonal year 2008 differences for the most recent ATSR-SU version with respect to MACv2_08 (left) and MISR (right) for AOD and its AODc and AODf contributions. Red colors indicate likely overestimates and blue colors suggest underestimates.*

Fine-mode AOD (AODf) contributions are too high, especially during biomass buring seasons and too high over oceans and many coastal regions, where AODf compensates for missing AODc (as for the Saharan outflow over the Atlantic). The different fine-mode and coarse-mode AOD attributions for the independent land and ocean retrievals actually cause a strong land-sea contrast for both AODf and AODc data. Since fine-mode AOD overestimates during times of biomass burning, as well as coarse-mode (dust) size underestimates could be associated with aerosol absorption underestimates, the provided seasonal SSA data and differences to those of the MACv2 aerosol climatology are compared in Figure 6.4.

Figure 6.4 *seasonal year 2008 assumed SSA by ATSR-SU (left) and seasonal SSA differences to the MACv2 climatology (right, red/yellow colors indicate SSA overestimates /missed absorption potential)*

The seasonal patterns of the assumed aerosol absorption potential (SSA) in the ATSR-SU retrieval is quite relatistic (with maxima over biomass burning regions and dust AOD maxima, where also dust sizes are larger). However, in regions where fine-mode biomass burning absorption is dominant the absorption potential is too weak.

ATSR-FI seasonal AOD difference maps with respect to MACv2_08 and MISR

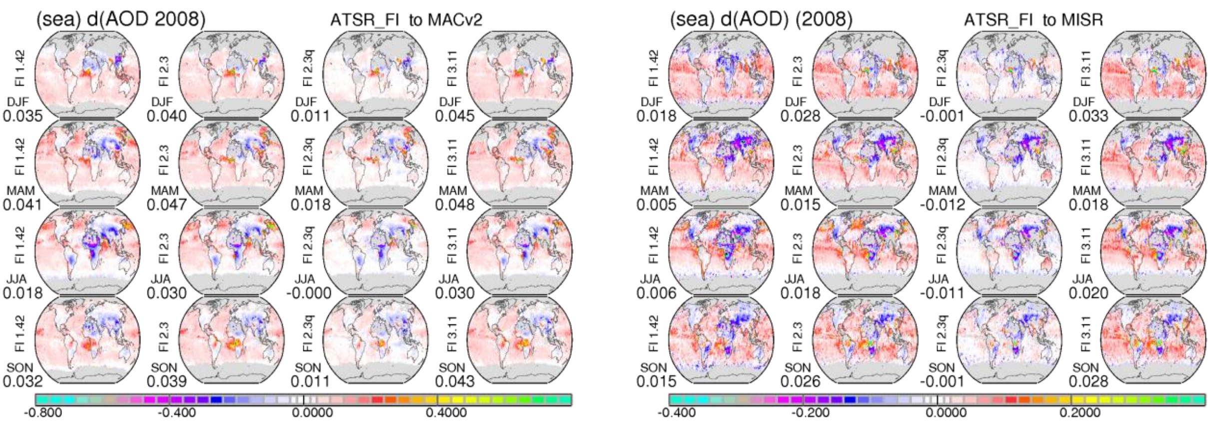

Figure 6.5 *seasonal year 2008 AOD differences for different ATSR-FI versions with respect to MACv2_08 (left) and MISR (right). The most recent retrieval is shown in the right column. Red colors indicate likely overestimates and blue colors suggest underestimates*

The new version 3.11 apparently has no quality filter (as in version 2.30 plume-quality) so that background AOD values over oceans are larger. Deviation spatial patterns strongly resemble those for version 2.30.

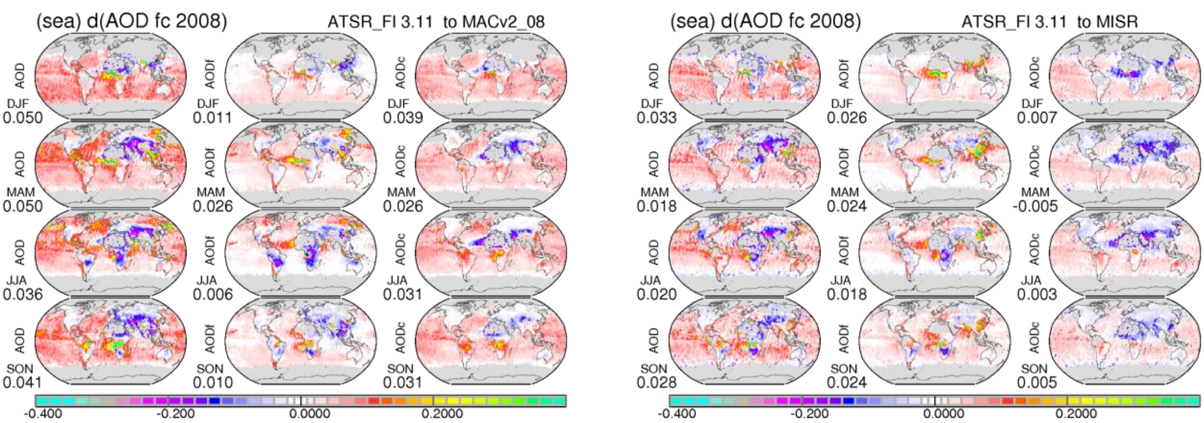

Figure 6.6 *seasonal year 2008 differences for the most recent ATSR-FI version with respect to MACv2_08 (left) and MISR (right) for AOD and its AODc and AODf contributions. Red colors indicate likely overestimates and blue colors suggest underestimates.*

The coarse-mode AOD in dust dominated regions is underestimated (if retrieved) especially over oceans, where in outflow regions fine-mode AOD overestimates compensate. However, coarse-mode AOD is too large over biomass buring regions and overestimates for coarse-mode AOD suggest cloud contamination. Fine-mode AOD is underestimated over bioamass burning regions and (as already mentioned) overestimated at oceanic dust outflow regions.

ATSR-OX seasonal AOD difference maps with respect to MACv2_08 and MISR

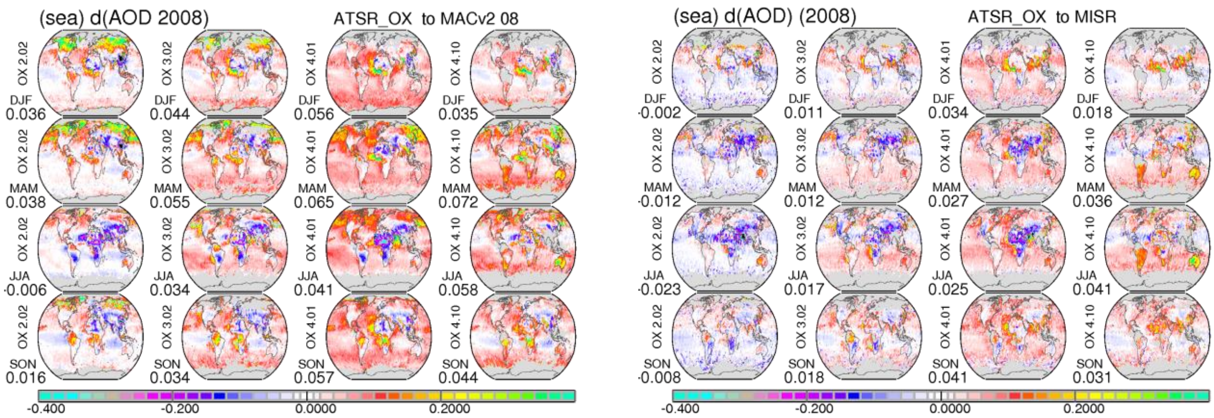

Figure 6.7 *seasonal year 2008 AOD differences for different ATSR-OX versions with respect to MACv2_08 (left) and MISR (right). The most recent retrieval is shown in the right column. Red colors indicate likely overestimates and blue colors suggest underestimates.*

The new version 4.11 is strongly improved over version 4.01 and actually more similar to the older version 3.02 without a few stronger biases. Still, there are AOD overestimates over biomass burning regions and AOD underestimates for dust outflow regions over oceans. Also AOD values over Australia in winter appear too large.

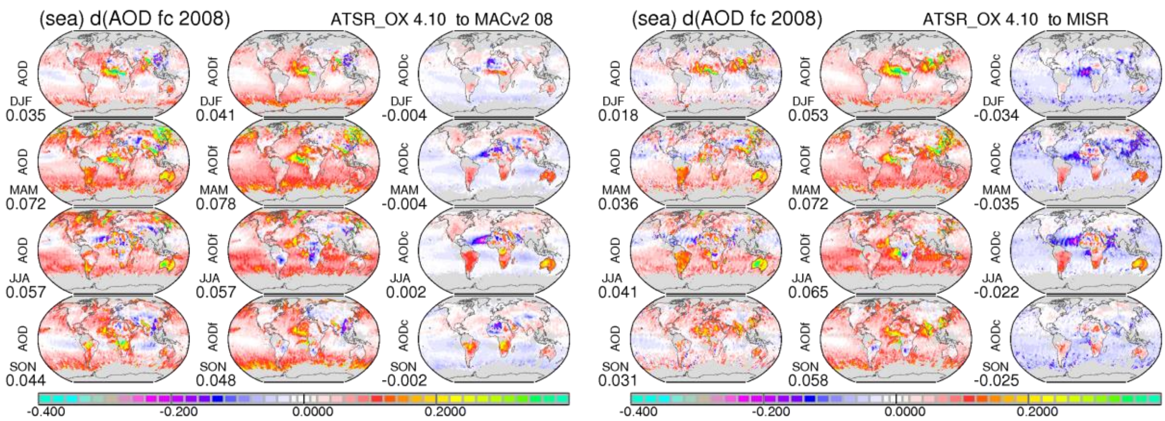

Figure 6.8 *seasonal year 2008 differences for the most recent ATSR-OX version with respect to MACv2_08 (left) and MISR (right) for AOD and its AODc and AODf contributions. Red colors indicate likely overestimates and blue colors suggest underestimates.*

The fine-mode AOD fraction in ATSR-OX is only diagnosed. It reveals that coarse-mode AOD is too strong over biomass regions and over Australia and coarse-mode AOD is too weak for dust-outflow onto oceans, where fine-mode AOD overestimates compensate. Fine-mode AOD is also too large over oceans at higher latitudes.

MERIS-XBAER seasonal AOD difference maps with respect to MACv2_08

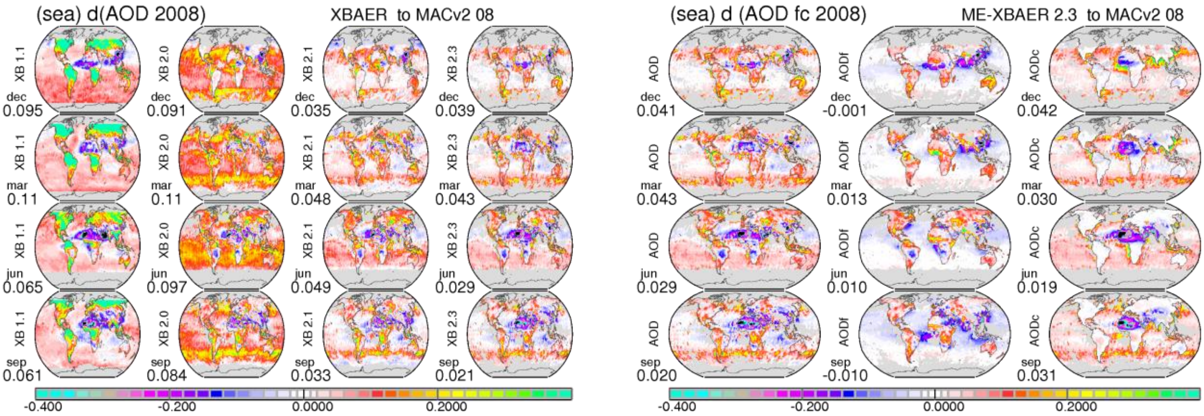

Figure 6.9 *seasonal month year 2008 AOD differences for different MERIS-XBAER versions (left) and for AODc, AODf contributions (right) of the most recent version with respect to MACv2_08. Red colors indicate likely overestimates and blue colors suggest underestimates.*

The MERIS-XBEAR retrieval shows continued improvement over time. Main biases of the current retrieval are strong coarse-mode AOD (dust) underestimates over Northern Africa and coarse mode AOD overestimates over SH oceans during Mar and Sep at mid-latitudes and NH oceans during Dec at mid-latitudes (which are likely caused by cloud contamination). Over oceans larger AOD are often incorrectly associated with coarse-mode AOD, as over coastal W.Africa in Dec and over coastal India.

MERIS-DLR (and other MERIS retrievals and to SeaWiFS) seasonal AOD difference maps with respect to MACv2_08

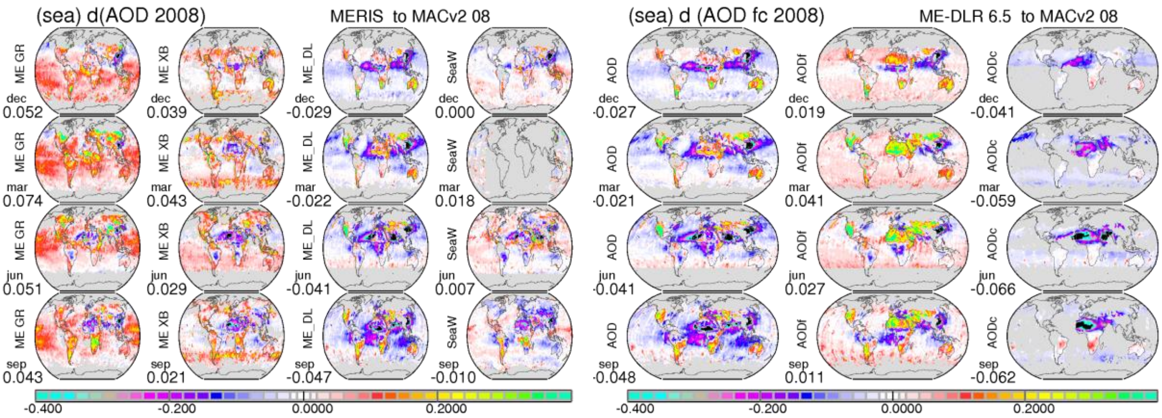

Figure 6.10 *seasonal month year 2008 AOD differences for different MERIS retrieval (left) and for the most recent MERIS-DLR retrievals the AODc, AODf contributions (right) of the most recent version with respect to MACv2_08. Red colors show overestimates and blue colors suggest underestimates.*

The MERIS-DLR retrieval is still in a developing phase and displays many larger biases. Main bias features are the coarse-mode AOD underestimates over continents and mostly missing data over oceans. The fine-mode has large AOD overestimates over continents.

ANGSTROM-ATSR All ATSR offer Angstrom parameters, but the diversity among the retrievals and to the MACv2 reference are large as illustrated in Figure 6.11.

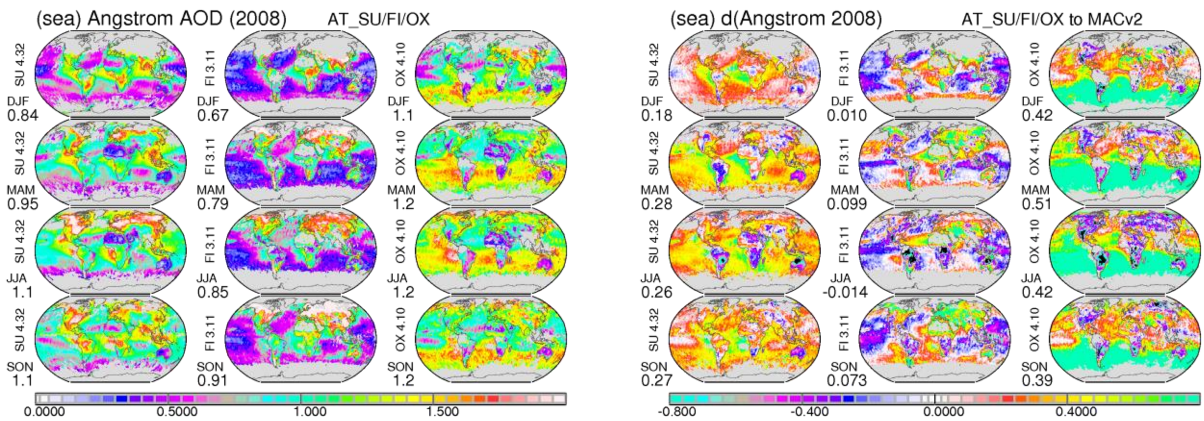

Figure 6.11 *seasonal Angstrom parameter of the most recent versions of the three ATSR (SU/FI/OX) retrievals (left) and Angstrom parameter differences to the MACv2 aerosol climatology. Light green colors indicate differences more positive than 0.8 and back colors differences more negative than -0.8.*

The value of the Angstrom parameters offered by the three ATSR retrievals is very limited. The differences to expectations (by the MACv2_08 cliatology) are often huge. Thus, for the size evaluation the focus was on AODf and AODc contributions.

7 EVALUATIONS OVER CHINA

Level 2 AOD data of the most recent ATSR retrievals (SU v4.32, FI v3.11, OX v4.10) of the year 2008 are evaluated against sun-photometer references of CARSNET (China operated) and AERONET (NASA operated - aeronet.gsfc.nasa.gov/) over China. Spatial distributions of applied AERONET and CARSNET reference sites are shown in Figure 7.1.

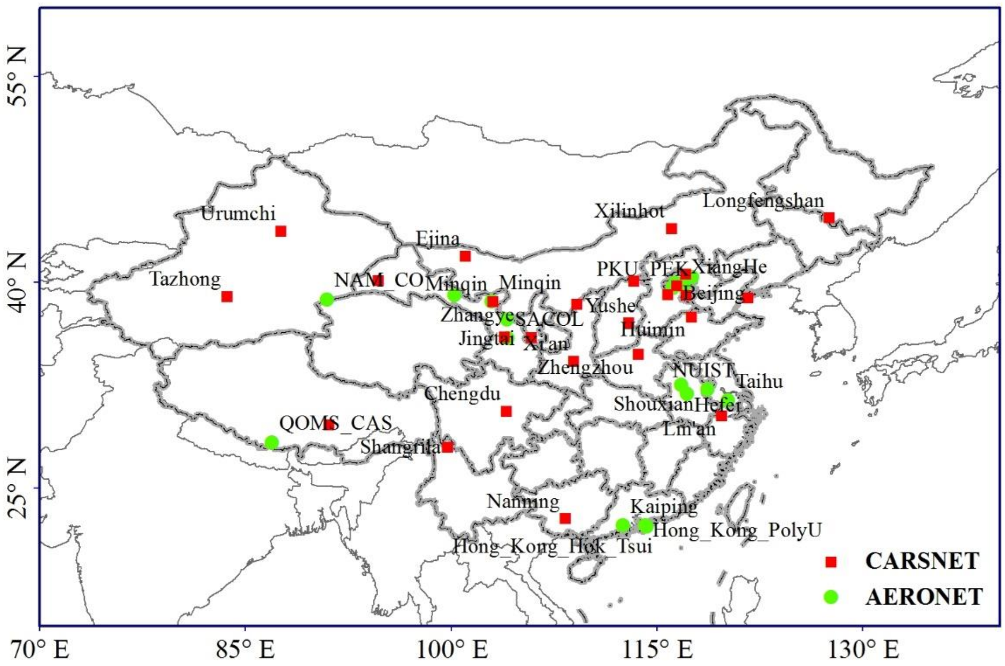

Figure 7.1 *Spatial distribution of AERONET and CARSNET sites in China*

Matches are based on ground samples within ±30min of satellite sensor (ATSR) overpasses. Satellite retrievals at overpasses were averaged over 5×5 pixels (ca 50*50km, L2 data). Successful matches required aerosol retrievals in least 5 (out or 25) pixels and minimum of 2 ground-based samples within the 1-hour time period.

In the evaluation below the following statistics measures (with are X_{SAT} representing the test-data and X_{AER} representing the reference data of matches) are applied:

<u>average **avg**</u>

$$\mathbf{avg}_{SAT} = \Sigma (X_{SAT}) / N = < X_{SAT} >$$

$$\mathbf{avg}_{AER} = \Sigma (X_{AER}) / N = < X_{AER} >$$

<u>absolute **bias**</u>

$$\mathbf{bias} = \Sigma (X_{SAT} - X_{AER}) / N$$

<u>normalized mean bias **NMB**</u>

$$\mathbf{NMB} = [\Sigma (X_{SAT} - X_{AER})/N] \; / \; < X_{AER} >$$

modified normalized mean bias **MNMB**

MNMB $= [\Sigma (X_{SAT} - X_{AER}) / N] / 0.5 * < (X_{AER} + X_{SAT}) >$

standard deviation **σ**

σ $= SQRT [\Sigma \{(X_{SAT} - X_{AER}) - < (X_{SAT} - X_{AER}) > \}^2 / N]$

root mean square error **RMSE**

RMSE $= {}_{SQRT} [(\Sigma (X_{SAT} - X_{AER})^2 / N]$

bias corrected root mean square error **RMSE-BC**

RMSE-BC $= {}_{SQRT} [\{\Sigma (X_{SAT} - X_{AER})^2 / N - (bias)^2 \}]$

correlation coefficient **R**

R $= \Sigma (X_{SAT} - <X_{sat}>) * (X_{AER} - < X_{AER} >) / \{_{SQRT} [(\Sigma (X_{SAT} - < X_{SAT} >)^2 * \Sigma (X_{AER} - < X_{AER} >)^2] \}$

Next, annual AOD maps and number of matches for the most recent ATSR-SU, ATSR-FI and ATSR-OX retrievals are presented in Figures 7.2, 7.3 and 7.4, respectively. Then, scatter-plots for all AOD matches (for each ATSR retrieval) are shown in Figure 7.5 and finally, bias values as function AOD (for each ATSR retrieval) are presented in Figure 7.6.

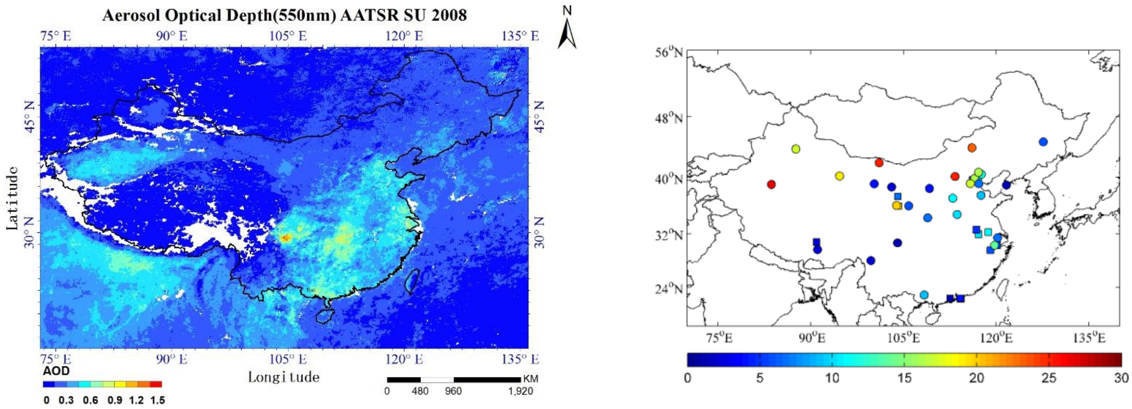

***Figure 7.2** annual average AOD for ATSR-SU v4.32 over China (left) and match frequency (right)*

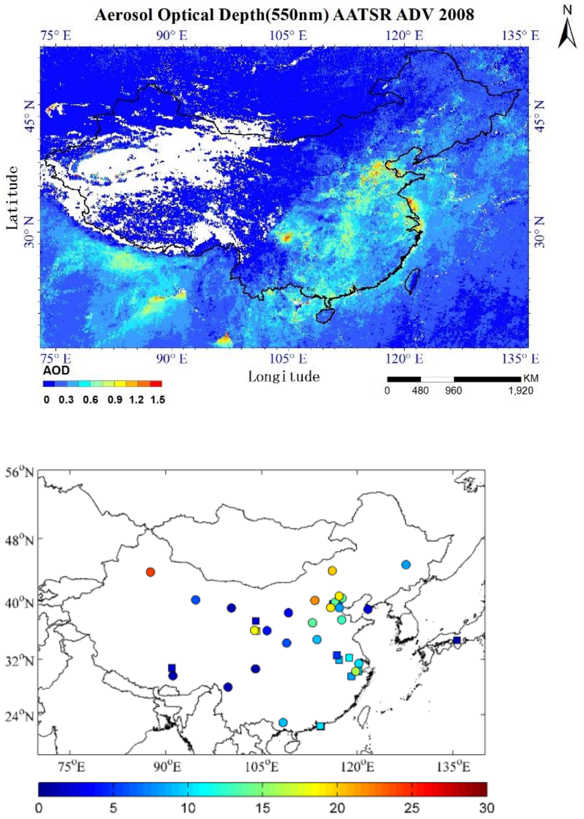

Figure 7.3 *annual average AOD for ATSR-FI v3.11 over China (left) and match frequency (right)*

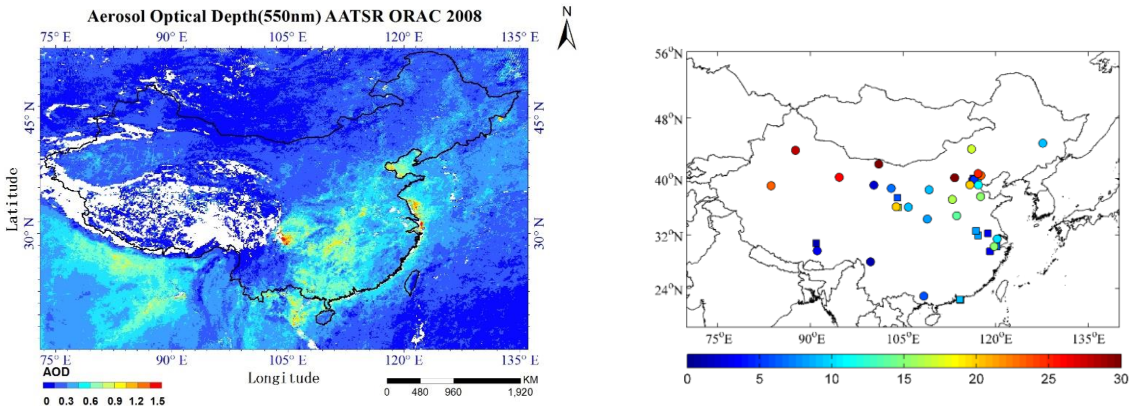

Figure 7.4 *annual average AOD for ATSR-OX v4.10 over China (left) and match frequency (right)*

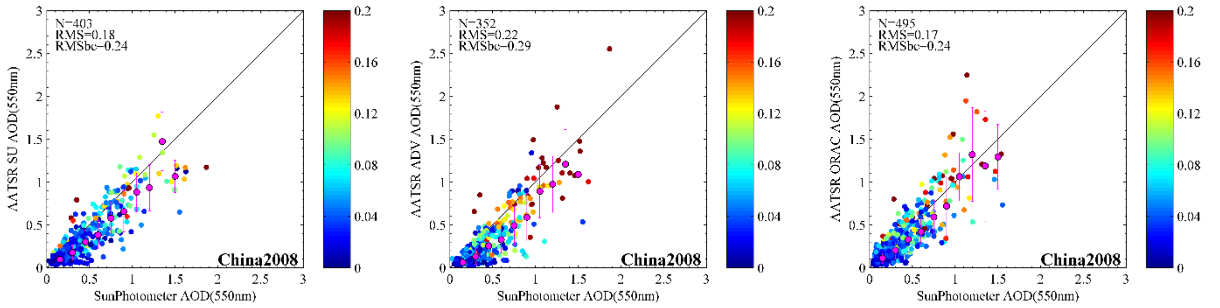

Figure 7.5 *scatter panels of AOD matches over ground sites of the larger China region for ATSR-SU (left), ATSR-FI (center) and ATSR-OX (right), and colors represent standard AOD standard deviations.*

Table 7.1 *summary of ATSR retrieval statistical evaluations*

Product	***n***	***<SAT >***	***<AER>***	***NMB [%]***	***RMSE***	***RMSE-BC***	***R***
ATSR-**SU v4.32**	403	0.350	0.431	-18.6	0.182	0.164	.871
ATSR-**FI v3.11** ***('ADV')***	352	0.317	0.439	-27.7	0.217	0.181	.849
ARSR-**OX v4.10** ***('ORAC')***	495	0.333	0.364	-8.4	0.172	0.169	.835

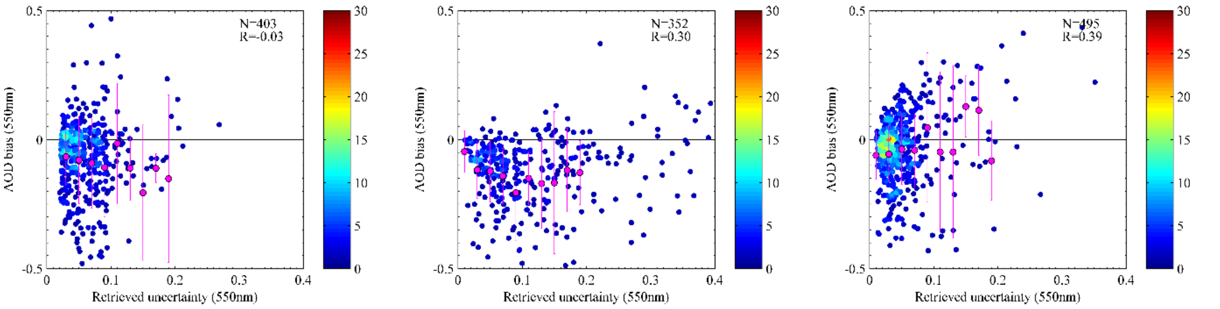

Figure 7.6 *scatter panels of AOD bias with retrieval uncertainty based on matches over ground sites of the larger China region for ATSR-SU (left), ATSR-FI (center) and ATSR-OX (right)*

highlights of the ATSR retrieval comparisons over China are

ATSR-SU (best coverage over the Qinghai-Tibetan Plateau with arid or semi-arid land cover)
- overall best performing ATSR retrieval (highest correlation coefficient R at 0.871) - even capturing at times extremely low AOD values over the Qinghai-Tibetan Plateau
- overall AOD underestimates (NMB at 0.81)
- most estimated uncertainties below 0.1 (even though real biases are larger)

ATSR-FI (smallest coverage and number of matchups - most coverage over eastern China)
- uncertainty increases strongest with AOD increase
- overall strong AOD underestimates (NMB at 0.72)
- estimated uncertainties at times very large, overestimates are rare

ATSR-OX (best overall coverage but less coverage over arid or semi-arid western China)

- overall weak AOD underestimates (NMB at 0.92)
- most estimated uncertainties below 0.1 (although estimated biases are larger)
- apparent quality by retrieved uncertainty

8 GLOBAL EVALUATIONS

Scores are used to summarize the retrieval skill. Here on a global scale general statistical measures compared to ground-based AOD and AODf data collected at ca 200 AERONET sites worldwide.

The evaluation statistics is based on (1x1deg) monthly averages to AERONET during 2008. Hereby monthly averages are defined by averages of those days only, when time matches between ground samples and satellites retrievals occurred. The applied statistical measures (with are X_{SAT} representing the test-data and X_{AER} representing the reference data of matches) are:

average **avg**

$\mathbf{avg}_{SAT} = \Sigma (X_{SAT}) / N = < X_{SAT} >$

$\mathbf{avg}_{AER} = \Sigma (X_{AER}) / N = < X_{AER} >$

absolute **bias**

$\mathbf{bias} = \Sigma (X_{SAT} - X_{AER}) / N$

normalized mean bias **NMB**

$\mathbf{NMB} = [\Sigma (X_{SAT} - X_{AER})/N] \; / \; < X_{AER} >$

modified normalized mean bias **MNMB**

$\mathbf{MNMB} = [\Sigma (X_{SAT} - X_{AER})/ N] \; / \; 0.5 * < (X_{AER} + X_{SAT}) >$

standard deviation σ

$\sigma = SQRT \, [\Sigma \{(X_{SAT} - X_{AER}) - < (X_{SAT} - X_{AER}) > \}^2 / N]$

root mean square error **RMSE**

$\mathbf{RMSE} = {}_{SQRT} [(\Sigma (X_{SAT} - X_{AER})^2 / N]$

bias corrected root mean square error **RMSE-BC**

$\mathbf{RMSE\text{-}BC} = {}_{SQRT} [\{\Sigma (X_{SAT} - X_{AER})^2 / N - (bias)^2 \}]$

correlation coefficient **R**

$\mathbf{R} = \Sigma (X_{SAT} - <X_{sat}>)*(X_{AER} - < X_{AER} >) \, / \, \{{}_{SQRT} [(\Sigma (X_{SAT} - < X_{SAT} >)^2 * \Sigma (X_{AER} - < X_{AER} >)^2] \}$

AOD – comparing statistics of the most recent versions and to older efforts

Table 8.1 *most recent version comparisons for AOD between ATSR, MISR and MODIS*

stat. parameter	**SU 4.32**	**ADV 3.11**	**ORAC 4.10**	***MISR 32***	***MODIS 6.1***
# of months	1075	1015	1091	*1509*	*1570*
# of stations	192	187	191	*199*	*204*
NMB [%]	**-1.9**	-.7.6	17.3	*-14.6*	*8.5*
MNMB [%]	**-1.5**	-8.8	19.5	*-14.2*	*7.3*
R	.868	.854	.862	*.816*	*.892*
RMSE	**.094**	.099	.096	*.117*	*.094*

Table 8.2 *most recent version comparisons for AOD between MERIS versions, MISR and MODIS*

stat. parameter	**XBAER 2.3**	**ME DLR 6.5**	**ME GRASP**	***MISR 32***	***MODIS 6.1***
# of months	435	343	467	*1509*	*1570*
# of stations	181	148	180	*199*	*204*
NMB [%]	14.7	-29.1	**11.7**	*-14.6*	*8.5*
MNMB [%]	25.2	-35.3	**21.3**	*-14.2*	*7.3*
R	**.732**	.325	.689	*.816*	*.892*
RMSE	.138	.208	**.135**	*.117*	*.094*

Table 8.3 *comparisons for AOD between ATSR-SU versions*

stat. parameter	**SU 4.32**	**SU 4.21**	**SU 4.0**
# of months	1075	1048	1092
# of stations	192	191	189
NMB [%]	**-1.9**	-7.7	-5.3
MNMB [%]	**-1.5**	-8.7	-5.1
R	**.868**	.791	.785
RMSE	**.094**	.119	.121

Table 8.4 *comparisons for AOD between ATSR-FI versions*

stat. parameter	**ADV 3.11**	**ADV 2.30_p**	**ADV 2.30**
# of months	1015	1015	1009
# of stations	187	186	185
NMB [%]	**-7.6**	-10.8	-16.8
MNMB [%]	**-8.8**	-14.2	-18.7
R	0.854	**0.855**	0.821
RMSE	**0.099**	0.101	0.106

Table 8.5 *comparisons for AOD between ATSR-OX versions*

stat. parameter	**ORAC 4.10**	**ORAC 4.01**	**ORAC 3.02**
# of months	1091	1312	1073
# of stations	191	197	188
NMB [%]	17.3	5.6	**-1.7**
MNMB [%]	19.5	13.7	**-2.5**
R	**.862**	.763	.724
RMSE	**.096**	.113	.120

Table 8.6 *comparisons for AOD between MERIS XBAER versions*

stat. parameter	**XBAER 2.3**	**XBAER 2.1**	**XBAER 2.0**	**XBAER 1.1**
# of months	435	448	445	500
# of stations	181	183	185	185
NMB [%]	14.7	**14.4**	19.0	42.5
MNMB [%]	25.2	**23.1**	30.3	42.6
R	**.732**	0.705	.665	.364
RMSE	**.138**	0.140	.150	.241

AODf - comparing statistics of the most recent versions and to older efforts

Table 8.7 *most recent version comparisons for AODf between ATSR, MISR and MODIS*

stat. parameter	SU 4.32	ADV 3.11	ORAC 4.10	*MISR 32*	*MODIS 6.1*
# of months	813	778	819	*1166*	*548*
# of stations	159	157	157	*163*	*78*
NMB	11.8	**-4.0**	27.5	*-31,6*	*38.9*
MNMB	16.9	**-4.5**	27.3	*-24.4*	*38.5*
R	.831	**.849**	.778	*.722*	*.749*
RMSE	**.083**	**.083**	.091	*.118*	*.126*

Table 8.8 *comparisons for AODf between ATSR-FI versions*

stat. parameter	ADV 3.11	ADV 2.30_p	ADV 2.30
# of months	778	777	774
# of stations	157	156	155
NMB	-4.0	**2.5**	-3.1
MNMB	-4.5	**1.2**	-2.7
R	.849	**.850**	.813
RMSE	**.083**	.086	.086

Table 8.9 *comparisons for AODf between ATSR-OX versions*

stat. parameter	ORAC 4.10	ORAC 4.01	ORAC 3.02
# of months	819	1000	816
# of stations	157	163	154
NMB	27.5	13.8	**7.6**
MNMB	27.3	18.1	**8.5**
R	**.778**	.744	.643
RMSE	.091	**.089**	.103

Table 8.10 *comparisons for AODf between ATSR-SU versions*

stat. parameter	SU 4.32	SU 4.21	SU 4.0
# of months	813	794	
# of stations	159	158	
NMB	11.8	**-10.6**	
MNMB	16.9	**-5.5**	
R	**.831**	.781	
RMSE	**.083**	.088	

Comparing correlations (R) and root-mean square errors (RMS) to AERONET data, the following conclusions could be drawn.

AOD retrievals

- Among the current three ATSR retrievals ATSR-SU (Swansea) has the highest correlation (R=.868) and the lowest Root Mean Square error (RMS=0.94). Still, the MODIS C6.1 correlation (R=.892) is higher.
- Among the current MERIS retrievals, MERIS-XBEAR 2.3 has the highest correlation (R=.732) and the MERIS-GRASP has the lowest Root Mean Square error (RMS=1.35). Still the skill of all MERIS retrievals remains way below those for retrievals by MODIS, MISR and ATSR.

AODf retrievals

- Among the current three ATSR retrievals ATSR-FI (Finland) has the highest correlation (R=.849) and shares with ATSR-SU (Swansea) the lowest Root Mean Square error (RMSE=0.83).

temporal improvement

- ATSR-SU, ATSR-OX and MERIS-XBEAR show retrieval improvements over time
- ATSR-FI also would have shown improvement over time, if quality selections would have been applied

9 RANK-BASED SCORING

Scores are used to summarize and rank retrieval skill. A rank based combination score summarizes test-data performances to references (of MACv2 and AERONET/MAN) via rank-based biases and rank-based correlations, separately for time and space on a regional basis. Regional combination scores are then combined via area weights into global scores. An outline of this method is provided first - before scoring results are presented and ranked.

The combination score method has been developed that satisfies the need to summarize the overall performance of test-data against trusted reference data by a single value and to provide detailed diagnostics at sub-scales at the same time. This is possible by making the overall score a combination of multiple sub-scores. First, at the smallest (temporal and spatial) scales bias and correlations are determined and later combined. Sub-scores for bias and variability are the basis for the eventual single overall score. To reduce potential mis-interpretations due to a few data outliers, the sub-scoring is preferentially based on value ranks instead of actual values and on central statistics (e.g. median, interquartile average and range) instead on general (Gaussian) statistics (e.g. averages and standard deviation).

Bias sub-score S_B

The bias score S_B [-1, +1] is based on the bias error E_B [-1, +1]. For sufficient (10 or more) data-pairs of a test-data ***D*** and a corresponding reference-data ***R*** the bias error E_B is determined the following way:

- put all elements of both test-data ***D*** and of reference-data ***R*** into a single array ***A***
- re-order elements in array ***A*** in increasing order and assign each element its rank
- sum the ranks associated with reference data ***R*** (R_{sum}) and test data ***D*** (D_{sum})
- determine a weight factor ***w*** which is smaller than 1 only, if the variability (via interquartile range, iq_{range}) falls below central values (via interquartile average, iq_{avg}).

$$E_B = w * \frac{D_{sum} - R_{sum}}{D_{sum} + R_{sum}}, \qquad w = \max\{\frac{D, iq_{range} + R, iq_{range}}{D, iq_{avg} + R, iq_{avg}}, 1\} \qquad (1)$$

The bias error E_B can be positive or negative, but never larger than 1 or smaller than -1. The weight ***w*** is applied to reduce the impact of bias errors in cases of low variability, because for lower variability a bias error is less meaningful. Now based on the bias error E_B the bias score S_B is determined.

$$S_B = 1 - E_B, \quad if \quad E_B > 0 \qquad\qquad S_B = -1 + E_B, \quad if \quad E_B < 0 \qquad (2)$$

The bias score S_B has two important elements: the absolute value and the sign. The sign indicates the direction of the bias. The meaning of the absolute value is illustrated by a simple example. For instance, when the rank sum of the one data-set is twice as large as the rank-sum of the other data-set (which is a significant bias) then the (absolute) bias error value is 0.33. This (absolute) error value may even get smaller, if the relative variability (compared to central values) is small. Thus, for weak to moderate biases, bias scores should be close to (absolute) 0.9 or better.

Variability score S_V

The variability score S_V [0, 1] is based on the variability error E_V [0, 1]. And the variability error score is based on correlations. For sufficient (10 or more) data-pairs associated with test-data ***D*** and corresponding reference-data ***R*** the variability error E_V is quantified with (Spearman) correlations of ranked elements the following way:

- rank all elements of the test data **D** in increasing order (D_{rank})
- rank all elements of the reference data **R** in increasing order (R_{rank})
- determine the (Spearman) rank correlation coefficient $\boldsymbol{R_C}$

$$Rc = 1 - \frac{6\sum_{i=1}^{n}(D_{rank} - R_{rank})_i^2}{n(n^2-1)} \qquad (3)$$

- determine a weight factor ***w*** which is smaller than 1 only, if the variability (via interquartile range, iq_{range}) falls below central values (via interquartile average, iq_{avg}).

$$E_V = w*(1 - Rc/2), \qquad w = \max\{\frac{D, iq_{range} + R, iq_{range}}{D, iq_{avg} + R, iq_{avg}}, 1\} \qquad (4)$$

By definition, the variability error $\boldsymbol{E_V}$ is zero for a perfect correlation (***Rc*** = 1). Alternately perfect anti-correlation (***Rc*** = -1) yields a maximum variability error of 1. That means that no correlation (***Rc*** = 0) yields $\boldsymbol{E_V}$ = 0.5. This error is further reduced via weight ***w*** for cases when variability is small compared to central values. Temporal and spatial variability is examined. Spatial variability errors $\boldsymbol{E_S}$ are determined for at each time-step. Temporal variability errors $\boldsymbol{E_T}$ are determined at each grid-location. Based on the variability errors $\boldsymbol{E_S}$, $\boldsymbol{E_T}$ the associated variability score $\boldsymbol{S_S}$, $\boldsymbol{S_T}$ are determined and averaged into the overall variability score.

$$S_V = (S_S + S_T)/2 \quad S_S = 1 - E_S(spatial) \quad S_T = 1 - E_T(temporal) \qquad (5)$$

To illustrate the variability score, the case of a (good) correlation with ***Rc*** of 0.8 translates into a variability score $\boldsymbol{S_V}$ of 0.9. In cases of low variability this score will even be higher.

overall score *S*

In a final step the two scores for bias $\boldsymbol{S_B}$ and variability $\boldsymbol{S_V}$ are combined by multiplication into an overall score ***S***. This score ***S*** caries the sign of the bias. The deviation of the absolute score from a perfect score of 1 defines the overall error ***E***.

$$S = S_B * S_V \qquad E = 1 - |S| \qquad (6)$$

Similarly (although without the bias sign information) absolute scores from different properties can be combined via multiplication, if desired. By retaining the sub-scores for bias and individual variability tests, poor performance in an overall score can be traced back to particular data-pairs.

Here, the scoring method examines global distributions for AOD, AODf and AODc of the test-data sets to matches of monthly MACv2-08 data and to daily AERONET/MAN data for 2008 in sub-regions of Figure 9.1 and regional scores via area weights are combined into a global scores for test data-sets of Table 9.1 These global scores are ranked in subsequent tables.

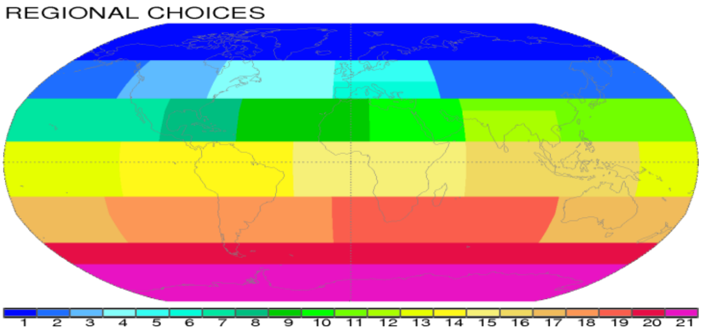

Figure 9.1 *21 sub-regions applied for the combinations scoring. Only regions with a higher AERONET site density are smaller.*

Table 9.1 *overview of evaluated AOD retrieval test-data (**D**)*

		latest …. older → versions
ATSR **SU**	Swansea Uni	**AnS08**, AS043, AS042, ATS31
ATSR **FI**	FMI, Helsinki	**AnF08**, AQF08, AF23p, AF142
ATSR **OX**	RAL, Oxford	**AnO08**, A4O08, AO302, AO202
ATSR **EN**	DLR ensemble	**A7E08**, ATE08
AT/MERIS **M**	Swansea Uni	AMS08
MERIS **MED**	DLR, Munich	**M6D08**, M4B08 (ocean only)
MERIS **MEB**	IUP, Bremen	**M5B08**, M4B08, M3B08, M2B08, MB011
MERIS **MGR**	LOA, Lille	**MGR08**
GRASP **GR**	LOA, Lille	Gpo08 (Africa only)
MISR **MI**	NASA, Pasadena	**Mid08**, MIS08
MODIS **MO**	NASA, Wash.DC	**MOc61**, MOC6x, MOC5T
SeaWiFS **SW**	NASA, Wash.DC	**SW002**
AVHRR **AVH**	NASA, Wash.DC	**AVH08**
PMDa **PMD**	EUMETSAT	**PMD08**
POLDER**POL**	LOA	POL30 (ocean only)

In tables below the retrieval performances are ranked via its combination score ('combo'). In addition, the tables list contributing sub-scores for temporal correlation ('temp'), bias ('bias') and spatial correlation ('spatial'), the median AOD of the test-data ***D***, the median AOD of the reference data ***R***, relative error, relative bias and in the right column the label of the examined test-data ***D*** (for details see Table 9.1). Hereby, the scores for the most recent ATSR and MERIS retrievals versions are highlighted in brown and for comparison, current versions of commonly used MODIS and MISR data are indicated in blue.

AOD scoring

***all AOD** – ranking **global** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.7510	0.751	0.843	0.891	0.811	0.130	0.120	0.32E+00	0.97E-01	AS042m
2	0.7460	0.746	0.849	0.879	0.812	0.140	0.120	0.32E+00	0.15E+00	ATS31m
3	**0.7440**	**0.744**	**0.851**	**0.874**	**0.813**	**0.140**	**0.120**	**0.33E+00**	**0.18E+00**	**AnS08m**
4	0.7440	0.744	0.847	0.878	0.811	0.140	0.120	0.32E+00	0.16E+00	AS043m
5	0.7440	0.744	0.847	0.878	0.811	0.140	0.120	0.32E+00	0.16E+00	ATS30m

6	0.7220	0.722	0.831	0.869	0.784	0.130	0.120	0.36E+00	0.13E+00	AQF08m
7	0.7190	0.719	0.839	0.858	0.803	0.150	0.120	0.39E+00	0.26E+00	ATE08m
8	**0.7090**	**0.709**	**0.823**	**0.861**	**0.783**	**0.140**	**0.120**	**0.36E+00**	**0.20E+00**	**Mid08m**
9	0.7070	0.707	0.836	0.845	0.803	0.150	0.120	0.40E+00	0.30E+00	A7E08m
10	0.7010	0.701	0.790	0.887	0.723	0.120	0.120	0.37E+00	0.29E-01	SW002m
11	0.6940	0.694	0.799	0.869	0.780	0.130	0.120	0.37E+00	0.15E+00	AVH08m
12	0.6890	0.689	0.849	0.811	0.799	0.180	0.120	0.54E+00	0.47E+00	PMD08m
13	0.6830	0.683	0.836	0.818	0.801	0.150	0.120	0.48E+00	0.36E+00	MO608m
14	0.6750	0.675	0.823	0.821	0.755	0.140	0.120	0.46E+00	0.24E+00	AF142m
15	0.6670	0.667	0.831	0.803	0.787	0.170	0.120	0.53E+00	0.46E+00	A4O08m
16	0.6670	0.667	0.848	0.787	0.857	0.270	0.180	0.52E+00	0.46E+00	Gpo08m
17	0.6640	0.664	0.829	0.801	0.819	0.160	0.110	0.48E+00	0.44E+00	Pol30m
18	0.6550	0.655	0.812	0.808	0.750	0.150	0.120	0.49E+00	0.31E+00	AF23pm
19	**0.6550**	**0.655**	**0.808**	**0.810**	**0.751**	**0.160**	**0.120**	**0.49E+00**	**0.32E+00**	**AnF08m**
20	0.6500	0.650	0.812	0.801	0.752	0.170	0.120	0.50E+00	0.40E+00	MGR08m
21	0.6490	0.649	0.829	0.782	0.797	0.170	0.110	0.53E+00	0.47E+00	MO508m
22	**0.6450**	**0.645**	**0.824**	**0.783**	**0.796**	**0.170**	**0.120**	**0.54E+00**	**0.45E+00**	**MOc61m**
23	**0.6430**	**0.643**	**0.791**	**0.814**	**0.784**	**0.170**	**0.120**	**0.50E+00**	**0.41E+00**	**AnO08m**
24	**0.6370**	**0.637**	**0.777**	**0.820**	**0.749**	**0.160**	**0.120**	**0.47E+00**	**0.33E+00**	**M4B08m**
25	0.6290	0.629	0.773	0.814	0.737	0.160	0.120	0.47E+00	0.35E+00	AO202m
26	0.6290	0.629	0.773	0.814	0.737	0.160	0.120	0.47E+00	0.35E+00	AO302m
27	0.6220	0.622	0.785	0.793	0.731	0.220	0.120	0.64E+00	0.55E+00	M1B08m
28	0.6160	0.616	0.800	0.770	0.749	0.180	0.120	0.58E+00	0.50E+00	Mis08m
29	0.6140	0.614	0.740	0.830	0.746	0.150	0.120	0.45E+00	0.25E+00	M3B08m
30	0.5980	0.598	0.777	0.769	0.751	0.210	0.120	0.67E+00	0.62E+00	M2B08m
31	0.4680	0.468	0.628	0.745	0.573	0.240	0.140	0.78E+00	0.51E+00	M4D08m

***all AOD** – ranking **oceanic** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.7600	0.760	0.846	0.898	0.813	0.100	0.090	0.28E+00	0.11E+00	AS042m
2	0.7520	0.752	0.851	0.884	0.814	0.110	0.091	0.30E+00	0.17E+00	AS031m
3	**0.7480**	**0.748**	**0.854**	**0.876**	**0.815**	**0.110**	**0.091**	**0.31E+00**	**0.20E+00**	**AnS08m**
4	0.7480	0.748	0.848	0.882	0.813	0.110	0.091	0.30E+00	0.17E+00	AS043m
5	0.7220	0.722	0.833	0.867	0.787	0.100	0.086	0.34E+00	0.20E+00	AQF08m
6	0.7200	0.720	0.813	0.885	0.721	0.097	0.089	0.35E+00	0.82E-01	SW002m
7	0.7120	0.712	0.844	0.843	0.815	0.120	0.091	0.40E+00	0.34E+00	ATE08m
8	**0.7110**	**0.711**	**0.827**	**0.860**	**0.790**	**0.110**	**0.091**	**0.34E+00**	**0.22E+00**	**Mid08m**
9	0.7010	0.701	0.864	0.811	0.824	0.130	0.091	0.48E+00	0.40E+00	MOC6xm
10	0.6960	0.696	0.839	0.830	0.810	0.130	0.091	0.43E+00	0.38E+00	A7E08m
11	0.6960	0.696	0.812	0.857	0.799	0.120	0.091	0.37E+00	0.23E+00	AVH08m
12	0.6940	0.694	0.864	0.803	0.827	0.150	0.090	0.59E+00	0.56E+00	PMD08m
13	0.6710	0.671	0.833	0.805	0.783	0.150	0.091	0.58E+00	0.52E+00	MB011m
14	0.6670	0.667	0.849	0.786	0.818	0.140	0.086	0.52E+00	0.50E+00	PO030m
15	0.6650	0.665	0.834	0.797	0.803	0.150	0.092	0.55E+00	0.52E+00	A4O08m
16	**0.6650**	**0.665**	**0.848**	**0.784**	**0.812**	**0.140**	**0.091**	**0.53E+00**	**0.45E+00**	**MO61xm**
17	0.6640	0.664	0.848	0.784	0.823	0.140	0.089	0.52E+00	0.48E+00	MOC5Tm
18	0.6630	0.663	0.855	0.775	0.841	0.190	0.120	0.60E+00	0.57E+00	Gpo08m
19	0.6620	0.662	0.818	0.810	0.761	0.120	0.087	0.47E+00	0.37E+00	AF142m
20	0.6550	0.655	0.825	0.794	0.773	0.150	0.091	0.52E+00	0.47E+00	MGR08m
21	**0.6430**	**0.643**	**0.807**	**0.797**	**0.749**	**0.130**	**0.087**	**0.51E+00**	**0.44E+00**	**AnF08m**
22	0.6390	0.639	0.808	0.792	0.749	0.130	0.086	0.52E+00	0.44E+00	AF23pm
23	0.6250	0.625	0.771	0.811	0.762	0.130	0.092	0.46E+00	0.38E+00	AO202m
24	0.6250	0.625	0.771	0.811	0.762	0.130	0.092	0.46E+00	0.38E+00	AO302m
25	**0.6160**	**0.616**	**0.764**	**0.806**	**0.781**	**0.140**	**0.091**	**0.51E+00**	**0.43E+00**	**AnO08m**
26	**0.6150**	**0.615**	**0.763**	**0.806**	**0.740**	**0.130**	**0.091**	**0.49E+00**	**0.37E+00**	**M4B08m**
27	0.6090	0.609	0.807	0.755	0.748	0.160	0.091	0.60E+00	0.56E+00	MIS08m
28	0.5970	0.597	0.740	0.807	0.730	0.130	0.091	0.46E+00	0.33E+00	M3B08m
29	0.5830	0.583	0.784	0.743	0.744	0.200	0.091	0.77E+00	0.75E+00	M2B08m
30	0.4410	0.441	0.600	0.734	0.556	0.240	0.100	0.88E+00	0.63E+00	M4D08m

***all AOD** – ranking **continental** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set

1	0.7770	0.777	0.860	0.904	0.852	0.260	0.250	0.29E+00	0.25E-01	SEV08m
2	**0.7690**	**0.769**	**0.863**	**0.891**	**0.846**	**0.200**	**0.180**	**0.31E+00**	**0.79E-01**	**AnS08m**
3	0.7670	0.767	0.863	0.889	0.845	0.200	0.180	0.31E+00	0.63E-01	AS031m
4	0.7660	0.766	0.862	0.888	0.844	0.200	0.180	0.31E+00	0.70E-01	AS043m
5	**0.7590**	**0.759**	**0.842**	**0.901**	**0.846**	**0.190**	**0.180**	**0.31E+00**	**0.72E-01**	**Mid08m**
6	0.7500	0.750	0.848	0.885	0.836	0.190	0.190	0.33E+00	0.42E-02	AS042m
7	0.7420	0.742	0.842	0.882	0.793	0.180	0.180	0.36E+00	-.35E-01	AQF08m
8	0.7330	0.733	0.844	0.869	0.813	0.200	0.180	0.34E+00	0.11E+00	ATE08m
9	0.7310	0.731	0.844	0.866	0.824	0.210	0.180	0.35E+00	0.17E+00	A7E08m
10	**0.7160**	**0.716**	**0.832**	**0.861**	**0.847**	**0.230**	**0.180**	**0.36E+00**	**0.23E+00**	**AnO08m**
11	0.7110	0.711	0.803	0.885	0.796	0.180	0.180	0.35E+00	0.32E-01	AVH08m
12	0.7080	0.708	0.830	0.853	0.819	0.200	0.180	0.37E+00	0.17E+00	MOC6xm
13	0.7030	0.703	0.838	0.839	0.757	0.180	0.180	0.43E+00	0.18E-01	AF142m
14	-0.6990	-0.699	0.788	-.887	0.775	0.160	0.170	0.39E+00	-.64E-01	SW002m
15	0.6960	0.696	0.846	0.823	0.824	0.240	0.180	0.41E+00	0.30E+00	MOC5Tm
16	0.6920	0.692	0.834	0.830	0.789	0.220	0.180	0.43E+00	0.29E+00	PMD08m
17	0.6910	0.691	0.829	0.833	0.809	0.220	0.180	0.40E+00	0.24E+00	MIS08m
18	0.6890	0.689	0.831	0.829	0.782	0.220	0.180	0.42E+00	0.26E+00	A4O08m
19	0.6890	0.689	0.829	0.831	0.869	0.210	0.160	0.37E+00	0.29E+00	PO030m
20	0.6880	0.688	0.828	0.831	0.759	0.200	0.180	0.45E+00	0.86E-01	AF23pm
21	**0.6870**	**0.687**	**0.826**	**0.831**	**0.761**	**0.200**	**0.180**	**0.45E+00**	**0.12E+00**	**AnF08m**
22	**0.6810**	**0.681**	**0.792**	**0.859**	**0.785**	**0.200**	**0.180**	**0.40E+00**	**0.15E+00**	**M4B08m**
23	0.6730	0.673	0.786	0.856	0.792	0.220	0.180	0.40E+00	0.20E+00	M3B08m
24	0.6710	0.671	0.842	0.798	0.871	0.330	0.230	0.46E+00	0.37E+00	Gpo08m
25	**0.6700**	**0.670**	**0.820**	**0.818**	**0.814**	**0.230**	**0.180**	**0.43E+00**	**0.29E+00**	**MO61xm**
26	0.6590	0.659	0.774	0.851	0.762	0.200	0.180	0.40E+00	0.16E+00	AO202m
27	0.6590	0.659	0.774	0.851	0.762	0.200	0.180	0.40E+00	0.16E+00	AO302m
28	0.6550	0.655	0.811	0.808	0.779	0.260	0.180	0.51E+00	0.41E+00	M2B08m
29	0.6530	0.653	0.812	0.805	0.763	0.230	0.180	0.47E+00	0.31E+00	MGR08m
30	0.5670	0.567	0.714	0.794	0.698	0.290	0.180	0.57E+00	0.39E+00	MB011m
31	0.5090	0.509	0.660	0.772	0.610	0.260	0.210	0.61E+00	0.26E+00	M4D08m

***all AOD** – ranking **global** scores based on matches of daily 1x1 deg averages with AERONET/MAN*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	**-0.7710**	**-0.771**	**0.854**	**-.902**	**0.000**	**0.400**	**0.390**	**0.30E+00**	**-.63E-02**	**AnO08d**
2	0.7560	0.756	0.827	0.914	0.847	0.370	0.330	0.27E+00	0.52E-01	PO030d
3	**-0.7500**	**-0.750**	**0.844**	**-.889**	**0.000**	**0.350**	**0.410**	**0.31E+00**	**-.18E+00**	**Mid08d**
4	**-0.7480**	**-0.748**	**0.830**	**-.901**	**0.000**	**0.380**	**0.380**	**0.32E+00**	**-.76E-01**	**AnS08d**
5	-0.7430	-0.743	0.827	-.899	0.000	0.370	0.380	0.32E+00	-.89E-01	AS043d
6	-0.7400	-0.740	0.828	-.894	0.831	0.360	0.400	0.36E+00	-.16E+00	MOC6xd
7	-0.7340	-0.734	0.828	-.886	0.822	0.340	0.380	0.34E+00	-.17E+00	ATE08d
8	-0.7330	-0.733	0.833	-.880	0.000	0.340	0.370	0.40E+00	-.17E+00	A4O08d
9	-0.7220	-0.722	0.820	-.881	0.000	0.340	0.380	0.34E+00	-.17E+00	AS042d
10	-0.7190	-0.719	0.827	-.869	0.000	0.320	0.390	0.40E+00	-.27E+00	AQF08d
11	-0.7170	-0.717	0.811	-.883	0.000	0.350	0.390	0.34E+00	-.16E+00	AS041d
12	-0.7160	-0.716	0.824	-.869	0.826	0.320	0.390	0.42E+00	-.26E+00	AF142d
13	-0.7130	-0.713	0.808	-.882	0.804	0.340	0.390	0.36E+00	-.17E+00	AS040d
14	0.7120	0.712	0.791	0.900	0.821	0.340	0.330	0.34E+00	-.50E-01	MA021d
15	**-0.7100**	**-0.710**	**0.806**	**-.881**	**0.790**	**0.370**	**0.400**	**0.40E+00**	**-.15E+00**	**MO61xd**
16	-0.7070	-0.707	0.798	-.887	0.816	0.380	0.400	0.38E+00	-.94E-01	MOC5Td
17	-0.7010	-0.701	0.785	-.894	0.820	0.350	0.380	0.36E+00	-.14E+00	A7E08d
18	-0.7000	-0.700	0.793	-.882	0.816	0.420	0.400	0.35E+00	0.49E-01	ME082d
19	-0.6970	-0.697	0.799	-.872	0.000	0.340	0.400	0.35E+00	-.18E+00	MIS22d
20	**-0.6960**	**-0.696**	**0.804**	**-.865**	**0.000**	**0.310**	**0.380**	**0.42E+00**	**-.26E+00**	**AnF08d**
21	-0.6960	-0.696	0.803	-.866	0.000	0.320	0.370	0.39E+00	-.18E+00	AO20qd
22	-0.6930	-0.693	0.779	-.889	0.825	0.370	0.360	0.36E+00	0.29E-02	MGR08d
23	-0.6890	-0.689	0.797	-.865	0.817	0.310	0.370	0.44E+00	-.27E+00	SW002d
24	-0.6880	-0.688	0.801	-.859	0.000	0.320	0.390	0.43E+00	-.29E+00	AF23pd
25	-0.6880	-0.688	0.801	-.860	0.000	0.310	0.370	0.41E+00	-.22E+00	AO202d
26	-0.6880	-0.688	0.789	-.872	0.813	0.320	0.350	0.42E+00	-.18E+00	AO302d
29	-0.6870	-0.687	0.795	-.864	0.793	0.340	0.400	0.45E+00	-.26E+00	AVH08d
30	**-0.6780**	**-0.678**	**0.768**	**-.883**	**0.786**	**0.330**	**0.380**	**0.43E+00**	**-.18E+00**	**M4B08d**
31	-0.6570	-0.657	0.783	-.839	0.000	0.300	0.370	0.49E+00	-.31E+00	AS000d
32	-0.6550	-0.655	0.752	-.870	0.776	0.340	0.380	0.44E+00	-.16E+00	M2B08d
33	-0.6540	-0.654	0.752	-.870	0.775	0.340	0.390	0.47E+00	-.20E+00	M3B08d

34	-0.6340	-0.634	0.775	-.818	0.000	0.260	0.370	0.55E+00	-.44E+00	AS031d
35	-0.6060	-0.606	0.724	-.837	0.762	0.360	0.380	0.50E+00	-.12E+00	MB011d
36	-0.5830	-0.583	0.692	-.843	0.000	0.300	0.390	0.59E+00	-.34E+00	PMD08d
37	**-0.5350**	**-0.535**	**0.694**	**-.770**	**0.000**	**0.230**	**0.410**	**0.91E+00**	**-.75E+00**	**M6D08d**
38	-0.5220	-0.522	0.637	-.819	0.655	0.290	0.400	0.86E+00	-.55E+00	M4D08d

***all AOD** – ranking **regional** scores based on matches of daily 1x1 deg averages with AERONET/MAN*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
	Arctic									
1	-0.6980	-0.698	0.806	-.883	0.776	0.094	0.110	0.43E+00	-.16E+00	SW002d
2	0.6970	0.697	0.855	0.840	0.805	0.099	0.077	0.46E+00	0.35E+00	AS042d
3	0.6830	0.683	0.783	0.868	0.792	0.082	0.071	0.39E+00	0.17E+00	AF23pd
4	0.6830	0.683	0.783	0.868	0.792	0.082	0.071	0.39E+00	0.17E+00	ATF08d
5	**0.6790**	**0.679**	**0.850**	**0.851**	**0.748**	**0.130**	**0.100**	**0.46E+00**	**0.26E+00**	**Mid08d**
6	**0.6750**	**0.675**	**0.863**	**0.816**	**0.793**	**0.100**	**0.074**	**0.46E+00**	**0.39E+00**	**AnS08d**
7	0.6730	0.673	0.860	0.817	0.787	0.099	0.073	0.47E+00	0.37E+00	AS043d
8	0.6730	0.673	0.860	0.817	0.787	0.099	0.073	0.47E+00	0.37E+00	ATS08d
9	0.6710	0.671	0.840	0.828	0.781	0.100	0.076	0.49E+00	0.38E+00	AS041d
10	0.6650	0.665	0.766	0.859	0.782	0.083	0.069	0.40E+00	0.19E+00	AQF08d
11	0.6570	0.657	0.794	0.833	0.782	0.100	0.073	0.50E+00	0.35E+00	PO030d
12	-0.6530	-0.653	0.760	-.862	0.754	0.075	0.070	0.49E+00	0.12E-02	AF142d
13	0.6510	0.651	0.843	0.792	0.801	0.110	0.075	0.54E+00	0.46E+00	AS040d
14	0.6510	0.651	0.796	0.803	0.827	0.190	0.100	0.61E+00	0.48E+00	MGR08d
15	0.6500	0.650	0.841	0.826	0.736	0.120	0.079	0.49E+00	0.38E+00	AO202d
16	0.6340	0.634	0.813	0.787	0.797	0.099	0.069	0.48E+00	0.40E+00	A7E08d
17	**0.6340**	**0.634**	**0.753**	**0.814**	**0.805**	**0.090**	**0.070**	**0.43E+00**	**0.30E+00**	**AnF08d**
18	0.6310	0.631	0.782	0.836	0.728	0.110	0.084	0.54E+00	0.28E+00	MOC6xd
19	0.6200	0.620	0.846	0.788	0.731	0.130	0.079	0.53E+00	0.47E+00	AO20qd
20	0.6050	0.605	0.815	0.792	0.717	0.140	0.082	0.58E+00	0.45E+00	AO302d
21	0.6050	0.605	0.815	0.792	0.717	0.140	0.082	0.58E+00	0.45E+00	ATO08d
22	0.6030	0.603	0.757	0.789	0.772	0.099	0.070	0.48E+00	0.39E+00	ATE08d
23	0.5930	0.593	0.748	0.841	0.664	0.078	0.081	0.55E+00	0.79E-02	AVH08d
24	0.5780	0.578	0.804	0.765	0.710	0.130	0.082	0.60E+00	0.50E+00	MIS22d
25	0.5660	0.566	0.723	0.814	0.669	0.150	0.089	0.67E+00	0.45E+00	MEB08d
26	0.5550	0.555	0.756	0.779	0.671	0.110	0.069	0.56E+00	0.44E+00	MA021d
27	0.5540	0.554	0.722	0.821	0.631	0.080	0.067	0.67E+00	0.65E-01	AS031d
28	**0.5530**	**0.553**	**0.753**	**0.791**	**0.649**	**0.160**	**0.092**	**0.70E+00**	**0.49E+00**	**M5B08d**
29	**0.5460**	**0.546**	**0.810**	**0.705**	**0.741**	**0.140**	**0.071**	**0.74E+00**	**0.71E+00**	**AnO08d**
30	0.5460	0.546	0.769	0.771	0.650	0.130	0.077	0.70E+00	0.46E+00	MOC5Td
31	**0.5380**	**0.538**	**0.728**	**0.758**	**0.692**	**0.130**	**0.079**	**0.62E+00**	**0.51E+00**	**MO61xd**
32	0.5290	0.529	0.804	0.682	0.748	0.150	0.070	0.76E+00	0.75E+00	A4O08d
33	0.5260	0.526	0.583	0.860	0.643	0.140	0.120	0.63E+00	0.18E+00	PMD08d
34	0.5160	0.516	0.634	0.792	0.670	0.150	0.086	0.62E+00	0.44E+00	M3B08d
35	0.4980	0.498	0.626	0.765	0.677	0.150	0.082	0.67E+00	0.52E+00	M2B08d
36	0.4920	0.492	0.739	0.792	0.523	0.130	0.068	0.75E+00	0.40E+00	AS000d
37	0.4850	0.485	0.682	0.754	0.607	0.150	0.082	0.72E+00	0.53E+00	M4B08d
38	0.4480	0.448	0.607	0.814	0.499	0.150	0.095	0.12E+01	-.67E-01	M4D08d
39	0.4120	0.412	0.602	0.663	0.640	0.210	0.076	0.86E+00	0.82E+00	ME082d
40	0.4090	0.409	0.638	0.654	0.613	0.300	0.097	0.93E+00	0.89E+00	MB011d
41	0.3860	0.386	0.699	0.741	0.389	0.120	0.053	0.11E+01	0.42E+00	MED08d
	NH3760_Asia									
1	**-0.7490**	**-0.749**	**0.852**	**-.889**	**0.833**	**0.240**	**0.320**	**0.37E+00**	**-.16E+00**	**Mid08d**
2	**-0.7450**	**-0.745**	**0.808**	**-.904**	**0.842**	**0.250**	**0.290**	**0.37E+00**	**-.77E-01**	**AnS08d**
3	0.7430	0.743	0.886	0.858	0.847	0.570	0.500	0.52E+00	0.34E+00	Gpo08d
4	**0.7390**	**0.739**	**0.813**	**0.881**	**0.864**	**0.240**	**0.220**	**0.35E+00**	**0.12E+00**	**AnO08d**
5	-0.7390	-0.739	0.794	-.904	0.842	0.230	0.270	0.38E+00	-.14E+00	AS042d
6	-0.7370	-0.737	0.806	-.903	0.828	0.250	0.280	0.38E+00	-.90E-01	AS043d
7	-0.7370	-0.737	0.806	-.903	0.828	0.250	0.280	0.38E+00	-.90E-01	ATS08d
8	-0.7300	-0.730	0.787	-.901	0.832	0.230	0.280	0.40E+00	-.14E+00	AS041d
9	-0.7180	-0.718	0.825	-.879	0.807	0.330	0.370	0.46E+00	-.11E+00	MOC6xd
10	-0.7150	-0.715	0.815	-.886	0.799	0.240	0.300	0.41E+00	-.18E+00	MIS22d
11	-0.7080	-0.708	0.761	-.895	0.823	0.230	0.290	0.43E+00	-.81E-01	AS040d
12	-0.6980	-0.698	0.757	-.891	0.811	0.280	0.320	0.42E+00	-.10E+00	A7E08d
13	**-0.6910**	**-0.691**	**0.781**	**-.881**	**0.788**	**0.300**	**0.340**	**0.48E+00**	**-.92E-01**	**MO61xd**
14	0.6910	0.691	0.778	0.884	0.786	0.300	0.310	0.48E+00	0.10E-01	MOC5Td

15	-0.6880	-0.688	0.769	-.888	0.782	0.200	0.240	0.49E+00	-.21E+00	AS000d
16	-0.6720	-0.672	0.768	-.846	0.821	0.210	0.270	0.51E+00	-.28E+00	AF142d
17	-0.6710	-0.671	0.789	-.865	0.763	0.230	0.270	0.55E+00	-.25E+00	SW002d
18	-0.6700	-0.670	0.757	-.872	0.780	0.220	0.280	0.48E+00	-.16E+00	ATE08d
19	-0.6680	-0.668	0.761	-.864	0.784	0.220	0.270	0.50E+00	-.23E+00	AQF08d
20	0.6670	0.667	0.773	0.850	0.799	0.200	0.250	0.47E+00	-.48E-02	A4O08d
21	-0.6650	-0.665	0.740	-.857	0.816	0.250	0.320	0.52E+00	-.26E+00	AF23pd
22	-0.6650	-0.665	0.740	-.857	0.816	0.250	0.320	0.52E+00	-.26E+00	ATF08d
23	-0.6640	-0.664	0.741	-.866	0.793	0.170	0.230	0.52E+00	-.26E+00	AS031d
24	**-0.6570**	**-0.657**	**0.721**	**-.855**	**0.817**	**0.210**	**0.280**	**0.53E+00**	**-.23E+00**	**AnF08d**
25	-0.6390	-0.639	0.751	-.836	0.777	0.290	0.350	0.60E+00	-.24E+00	AVH08d
26	-0.6240	-0.624	0.756	-.829	0.751	0.180	0.220	0.49E+00	-.93E-01	AO202d
27	0.6230	0.623	0.718	0.836	0.774	0.190	0.210	0.53E+00	-.42E-01	AO302d
28	0.6230	0.623	0.718	0.836	0.774	0.190	0.210	0.53E+00	-.42E-01	ATO08d
29	0.6210	0.621	0.766	0.827	0.737	0.190	0.220	0.49E+00	-.38E-01	AO20qd
30	-0.6210	-0.621	0.764	-.854	0.692	0.300	0.320	0.84E+00	-.27E+00	MED08d
31	0.6210	0.621	0.718	0.832	0.775	0.330	0.270	0.55E+00	0.24E+00	MGR08d
32	0.6110	0.611	0.731	0.850	0.706	0.220	0.260	0.60E+00	-.10E+00	MEB08d
33	0.6040	0.604	0.684	0.850	0.739	0.310	0.280	0.55E+00	0.20E+00	M3B08d
34	0.6020	0.602	0.688	0.860	0.711	0.240	0.280	0.54E+00	-.21E-01	M4B08d
35	0.6010	0.601	0.683	0.847	0.737	0.310	0.280	0.56E+00	0.20E+00	M2B08d
36	0.5980	0.598	0.693	0.823	0.762	0.400	0.350	0.62E+00	0.33E+00	ME082d
37	**0.5890**	**0.589**	**0.658**	**0.871**	**0.695**	**0.260**	**0.290**	**0.53E+00**	**-.18E-01**	**M5B08d**
38	-0.5600	-0.560	0.665	-.822	0.698	0.240	0.320	0.10E+01	-.54E+00	M4D08d
39	0.5470	0.547	0.653	0.805	0.706	0.340	0.330	0.62E+00	0.20E+00	MB011d
40	**-0.5420**	**-0.542**	**0.656**	**-.843**	**0.630**	**0.250**	**0.300**	**0.73E+00**	**-.33E+00**	**M6D08d**
41	-0.5110	-0.511	0.578	-.848	0.627	0.330	0.350	0.68E+00	-.99E-01	PMD08d
	NH3760_Amer									
1	-0.7720	-0.772	0.857	-.921	0.820	0.110	0.110	0.32E+00	-.14E-01	AS042d
2	**0.7580**	**0.758**	**0.875**	**0.895**	**0.821**	**0.120**	**0.110**	**0.33E+00**	**0.14E+00**	**Mid08d**
3	**0.7560**	**0.756**	**0.850**	**0.908**	**0.816**	**0.120**	**0.110**	**0.33E+00**	**0.80E-01**	**AnS08d**
4	-0.7550	-0.755	0.847	-.916	0.802	0.110	0.110	0.33E+00	0.98E-02	AS041d
5	0.7490	0.749	0.843	0.906	0.811	0.120	0.110	0.35E+00	0.43E-01	AS043d
6	0.7490	0.749	0.843	0.906	0.811	0.120	0.110	0.35E+00	0.43E-01	ATS08d
7	0.7270	0.727	0.823	0.901	0.792	0.120	0.110	0.36E+00	0.97E-01	AS040d
8	0.7230	0.723	0.844	0.872	0.813	0.120	0.110	0.38E+00	0.18E+00	MIS22d
9	-0.7100	-0.710	0.813	-.883	0.794	0.094	0.110	0.42E+00	-.16E+00	AF142d
10	0.6980	0.698	0.804	0.884	0.775	0.120	0.100	0.39E+00	0.11E+00	A7E08d
11	-0.6980	-0.698	0.794	-.890	0.774	0.095	0.110	0.45E+00	-.14E+00	AQF08d
12	-0.6960	-0.696	0.792	-.884	0.783	0.096	0.110	0.44E+00	-.15E+00	AF23pd
13	-0.6960	-0.696	0.792	-.884	0.783	0.096	0.110	0.44E+00	-.15E+00	ATF08d
14	0.6960	0.696	0.803	0.882	0.775	0.120	0.110	0.46E+00	0.81E-01	PO030d
15	**-0.6930**	**-0.693**	**0.770**	**-.902**	**0.766**	**0.100**	**0.110**	**0.38E+00**	**-.25E-01**	**AnF08d**
16	0.6910	0.691	0.804	0.884	0.761	0.110	0.100	0.40E+00	0.19E-01	ATE08d
17	**0.6710**	**0.671**	**0.842**	**0.809**	**0.818**	**0.150**	**0.098**	**0.51E+00**	**0.38E+00**	**AnO08d**
18	0.6710	0.671	0.804	0.882	0.721	0.110	0.092	0.47E+00	0.66E-01	MOC6xd
19	-0.6690	-0.669	0.779	-.878	0.746	0.082	0.100	0.44E+00	-.21E+00	AS031d
20	0.6540	0.654	0.749	0.871	0.751	0.110	0.095	0.48E+00	0.93E-01	AO302d
21	0.6540	0.654	0.749	0.871	0.751	0.110	0.095	0.48E+00	0.93E-01	ATO08d
22	-0.6490	-0.649	0.775	-.866	0.726	0.092	0.100	0.51E+00	-.17E+00	AS000d
23	**0.6440**	**0.644**	**0.776**	**0.883**	**0.685**	**0.100**	**0.090**	**0.52E+00**	**0.43E-01**	**MO61xd**
24	0.6360	0.636	0.735	0.845	0.771	0.130	0.096	0.47E+00	0.25E+00	AO202d
25	0.6340	0.634	0.810	0.809	0.759	0.150	0.098	0.50E+00	0.37E+00	A4O08d
26	0.6210	0.621	0.729	0.830	0.769	0.140	0.096	0.49E+00	0.31E+00	AO20qd
27	-0.6160	-0.616	0.781	-.829	0.706	0.079	0.093	0.60E+00	-.29E+00	SW002d
28	0.5900	0.590	0.785	0.820	0.659	0.150	0.092	0.66E+00	0.35E+00	MOC5Td
29	-0.5780	-0.578	0.693	-.851	0.665	0.077	0.094	0.56E+00	-.13E+00	AVH08d
30	0.5340	0.534	0.696	0.788	0.660	0.140	0.091	0.58E+00	0.45E+00	MA021d
31	**0.5250**	**0.525**	**0.701**	**0.787**	**0.634**	**0.150**	**0.090**	**0.68E+00**	**0.37E+00**	**M5B08d**
32	0.5220	0.522	0.679	0.786	0.651	0.160	0.096	0.68E+00	0.40E+00	M4B08d
33	0.5150	0.515	0.725	0.714	0.718	0.240	0.092	0.78E+00	0.70E+00	MGR08d
34	0.5110	0.511	0.682	0.761	0.662	0.170	0.093	0.67E+00	0.49E+00	M3B08d
35	0.5100	0.510	0.673	0.799	0.605	0.140	0.090	0.64E+00	0.36E+00	MEB08d
36	0.5020	0.502	0.692	0.743	0.660	0.170	0.092	0.67E+00	0.53E+00	M2B08d
37	-0.5000	-0.500	0.602	-.830	0.604	0.150	0.098	0.12E+01	-.23E+00	M4D08d
38	0.4730	0.473	0.614	0.799	0.571	0.180	0.110	0.10E+01	-.39E-01	MED08d
39	0.4550	0.455	0.553	0.797	0.590	0.170	0.120	0.70E+00	0.36E+00	PMD08d

40	**-0.4440**	**-0.444**	**0.534**	**-.814**	**0.558**	**0.130**	**0.097**	**0.98E+00**	**-.13E+00**	**M6D08d**
41	0.4130	0.413	0.657	0.629	0.655	0.360	0.097	0.10E+01	0.10E+01	ME082d
42	0.3720	0.372	0.589	0.604	0.645	0.370	0.092	0.11E+01	0.10E+01	MB011d
	NH3760_Atla									
1	**0.7960**	**0.796**	**0.898**	**0.914**	**0.845**	**0.130**	**0.120**	**0.29E+00**	**0.90E-01**	**Mid08d**
2	**0.7940**	**0.794**	**0.876**	**0.912**	**0.865**	**0.140**	**0.120**	**0.28E+00**	**0.12E+00**	**AnS08d**
3	0.7940	0.794	0.873	0.918	0.857	0.130	0.120	0.29E+00	0.75E-01	AS043d
4	0.7940	0.794	0.873	0.918	0.857	0.130	0.120	0.29E+00	0.75E-01	ATS08d
5	0.7860	0.786	0.859	0.924	0.842	0.130	0.130	0.29E+00	0.28E-01	AS042d
6	0.7670	0.767	0.842	0.916	0.833	0.130	0.130	0.31E+00	0.59E-01	AS041d
7	0.7470	0.747	0.860	0.889	0.823	0.150	0.130	0.34E+00	0.14E+00	A7E08d
8	0.7370	0.737	0.861	0.880	0.814	0.140	0.130	0.37E+00	0.13E+00	MIS22d
9	0.7370	0.737	0.864	0.887	0.798	0.140	0.120	0.36E+00	0.10E+00	MOC6xd
10	0.7340	0.734	0.847	0.886	0.810	0.150	0.130	0.35E+00	0.14E+00	ATE08d
11	-0.7300	-0.730	0.814	-.908	0.795	0.120	0.120	0.39E+00	-.26E-01	AQF08d
12	0.7220	0.722	0.857	0.881	0.785	0.140	0.120	0.41E+00	0.11E+00	PO030d
13	-0.7200	-0.720	0.812	-.891	0.804	0.120	0.120	0.39E+00	-.40E-01	AF23pd
14	-0.7200	-0.720	0.812	-.891	0.804	0.120	0.120	0.39E+00	-.40E-01	ATF08d
15	-0.7180	-0.718	0.806	-.894	0.799	0.110	0.120	0.43E+00	-.16E+00	AS031d
16	-0.7170	-0.717	0.813	-.892	0.794	0.120	0.120	0.38E+00	-.38E-01	AF142d
17	0.7170	0.717	0.867	0.860	0.800	0.160	0.130	0.40E+00	0.27E+00	AO202d
18	**0.7080**	**0.708**	**0.806**	**0.885**	**0.795**	**0.130**	**0.120**	**0.37E+00**	**0.73E-01**	**AnF08d**
19	0.7060	0.706	0.865	0.852	0.793	0.170	0.130	0.42E+00	0.31E+00	AO20qd
20	0.7050	0.705	0.796	0.892	0.785	0.140	0.130	0.37E+00	0.10E+00	AS040d
21	0.7020	0.702	0.814	0.873	0.794	0.160	0.130	0.42E+00	0.22E+00	AO302d
22	0.7020	0.702	0.814	0.873	0.794	0.160	0.130	0.42E+00	0.22E+00	ATO08d
23	0.6970	0.697	0.829	0.879	0.757	0.150	0.120	0.47E+00	0.10E+00	MOC5Td
24	-0.6960	-0.696	0.840	-.886	0.736	0.110	0.110	0.46E+00	-.12E+00	SW002d
25	-0.6910	-0.691	0.825	-.871	0.763	0.120	0.120	0.47E+00	-.98E-01	AS000d
26	**0.6860**	**0.686**	**0.832**	**0.855**	**0.772**	**0.150**	**0.120**	**0.42E+00**	**0.23E+00**	**MO61xd**
27	**0.6820**	**0.682**	**0.866**	**0.801**	**0.837**	**0.170**	**0.110**	**0.50E+00**	**0.46E+00**	**AnO08d**
28	-0.6570	-0.657	0.775	-.870	0.736	0.110	0.120	0.46E+00	-.34E-01	AVH08d
29	0.6360	0.636	0.824	0.782	0.804	0.180	0.110	0.53E+00	0.49E+00	A4O08d
30	0.6260	0.626	0.757	0.835	0.742	0.150	0.110	0.51E+00	0.24E+00	MA021d
31	-0.5820	-0.582	0.684	-.847	0.690	0.140	0.140	0.88E+00	-.24E+00	MED08d
32	0.5790	0.579	0.759	0.772	0.739	0.210	0.120	0.63E+00	0.52E+00	MGR08d
33	**0.5620**	**0.562**	**0.718**	**0.781**	**0.722**	**0.200**	**0.110**	**0.68E+00**	**0.50E+00**	**M5B08d**
34	0.5510	0.551	0.692	0.789	0.704	0.190	0.120	0.67E+00	0.48E+00	M4B08d
35	0.5500	0.550	0.683	0.787	0.716	0.180	0.120	0.63E+00	0.46E+00	M3B08d
36	0.5460	0.546	0.697	0.770	0.720	0.200	0.120	0.66E+00	0.54E+00	M2B08d
37	0.5310	0.531	0.692	0.772	0.684	0.200	0.110	0.67E+00	0.50E+00	MEB08d
38	0.5180	0.518	0.582	0.836	0.658	0.170	0.140	0.63E+00	0.19E+00	PMD08d
39	**-0.5160**	**-0.516**	**0.641**	**-.803**	**0.645**	**0.091**	**0.130**	**0.94E+00**	**-.56E+00**	**M6D08d**
40	-0.4910	-0.491	0.635	-.792	0.606	0.094	0.120	0.13E+01	-.70E+00	M4D08d
41	0.4650	0.465	0.676	0.700	0.655	0.280	0.120	0.77E+00	0.71E+00	ME082d
42	0.4560	0.456	0.690	0.679	0.652	0.300	0.120	0.81E+00	0.77E+00	MB011d
	NH3760_EU_n									
1	**-0.8320**	**-0.832**	**0.899**	**-.928**	**0.895**	**0.140**	**0.150**	**0.23E+00**	**-.69E-01**	**Mid08d**
2	-0.7990	-0.799	0.876	-.912	0.876	0.130	0.150	0.27E+00	-.10E+00	MIS22d
3	**-0.7710**	**-0.771**	**0.845**	**-.911**	**0.847**	**0.140**	**0.150**	**0.29E+00**	**-.61E-01**	**AnS08d**
4	0.7610	0.761	0.863	0.886	0.856	0.150	0.150	0.34E+00	-.25E-01	MOC6xd
5	-0.7550	-0.755	0.839	-.913	0.816	0.140	0.150	0.36E+00	-.73E-01	SW002d
6	-0.7510	-0.751	0.835	-.899	0.835	0.130	0.150	0.31E+00	-.12E+00	AS043d
7	-0.7510	-0.751	0.835	-.899	0.835	0.130	0.150	0.31E+00	-.12E+00	ATS08d
8	-0.7420	-0.742	0.843	-.892	0.821	0.130	0.150	0.33E+00	-.17E+00	AS042d
9	0.7320	0.732	0.820	0.893	0.820	0.160	0.150	0.40E+00	0.29E-01	MOC5Td
10	-0.7280	-0.728	0.827	-.892	0.806	0.130	0.150	0.34E+00	-.15E+00	AS041d
11	**0.7100**	**0.710**	**0.853**	**0.836**	**0.844**	**0.180**	**0.130**	**0.40E+00**	**0.32E+00**	**AnO08d**
12	-0.7070	-0.707	0.781	-.884	0.818	0.140	0.150	0.37E+00	-.44E-01	AS040d
13	**0.7010**	**0.701**	**0.816**	**0.867**	**0.801**	**0.150**	**0.140**	**0.42E+00**	**0.72E-02**	**MO61xd**
14	0.6950	0.695	0.777	0.884	0.795	0.150	0.140	0.37E+00	0.31E-01	A7E08d
15	-0.6900	-0.690	0.768	-.880	0.801	0.140	0.140	0.39E+00	-.68E-01	AF142d
16	-0.6820	-0.682	0.770	-.876	0.787	0.140	0.140	0.39E+00	-.51E-02	ATE08d
17	0.6770	0.677	0.802	0.845	0.800	0.180	0.140	0.41E+00	0.29E+00	A4O08d
18	0.6750	0.675	0.772	0.880	0.763	0.150	0.140	0.49E+00	0.26E-01	PO030d
19	0.6710	0.671	0.772	0.875	0.763	0.160	0.130	0.41E+00	0.17E+00	AO20qd
20	0.6680	0.668	0.770	0.878	0.751	0.140	0.130	0.40E+00	0.89E-01	AO202d

21	0.6680	0.668	0.802	0.832	0.805	0.200	0.140	0.43E+00	0.32E+00	MGR08d
22	-0.6640	-0.664	0.735	-.883	0.771	0.140	0.140	0.41E+00	-.39E-01	AQF08d
23	-0.6630	-0.663	0.778	-.860	0.763	0.120	0.140	0.44E+00	-.18E+00	AVH08d
24	-0.6610	-0.661	0.741	-.868	0.781	0.140	0.140	0.41E+00	-.33E-01	AF23pd
25	0.6610	0.661	0.734	0.869	0.788	0.150	0.140	0.40E+00	-.16E-03	AnF08d
26	-0.6610	-0.661	0.741	-.868	0.781	0.140	0.140	0.41E+00	-.33E-01	ATF08d
27	0.6420	0.642	0.716	0.870	0.762	0.140	0.140	0.47E+00	0.14E-01	AO302d
28	0.6420	0.642	0.716	0.870	0.762	0.140	0.140	0.47E+00	0.14E-01	ATO08d
29	-0.6390	-0.639	0.729	-.844	0.786	0.110	0.140	0.47E+00	-.26E+00	AS031d
30	0.6240	0.624	0.722	0.864	0.724	0.170	0.130	0.46E+00	0.23E+00	MA021d
31	-0.6130	-0.613	0.746	-.846	0.705	0.110	0.140	0.55E+00	-.29E+00	AS000d
32	0.6130	0.613	0.726	0.844	0.726	0.210	0.150	0.50E+00	0.26E+00	M5B08d
33	0.6000	0.600	0.737	0.863	0.657	0.180	0.150	0.47E+00	0.19E+00	MEB08d
34	0.5830	0.583	0.709	0.823	0.709	0.200	0.140	0.53E+00	0.31E+00	M4B08d
35	0.5520	0.552	0.721	0.759	0.734	0.240	0.140	0.57E+00	0.49E+00	ME082d
36	0.5510	0.551	0.685	0.792	0.706	0.220	0.140	0.57E+00	0.40E+00	M3B08d
37	0.5500	0.550	0.691	0.787	0.707	0.230	0.140	0.58E+00	0.43E+00	M2B08d
38	-0.5330	-0.533	0.601	-.883	0.607	0.170	0.170	0.59E+00	-.54E-01	PMD08d
39	0.5330	0.533	0.667	0.801	0.663	0.220	0.140	0.64E+00	0.33E+00	SEV08d
40	-0.5230	-0.523	0.643	-.836	0.609	0.130	0.140	0.11E+01	-.48E+00	M4D08d
41	0.4800	0.480	0.645	0.730	0.671	0.260	0.140	0.66E+00	0.57E+00	MB011d
42	0.4670	0.467	0.520	0.849	0.583	0.170	0.170	0.89E+00	-.22E+00	MED08d
43	-0.4620	-0.462	0.605	-.760	0.609	0.069	0.150	0.11E+01	-.88E+00	M6D08d
	NH3760_EU_s									
1	-0.8030	-0.803	0.881	-.927	0.852	0.140	0.150	0.28E+00	-.21E-01	Mid08d
2	-0.7920	-0.792	0.878	-.924	0.836	0.140	0.140	0.31E+00	-.41E-01	AnS08d
3	-0.7850	-0.785	0.874	-.921	0.833	0.140	0.150	0.31E+00	-.62E-01	AS043d
4	-0.7850	-0.785	0.874	-.921	0.833	0.140	0.150	0.31E+00	-.62E-01	ATS08d
5	-0.7780	-0.778	0.871	-.922	0.817	0.140	0.140	0.36E+00	-.55E-01	MOC6xd
6	-0.7690	-0.769	0.872	-.902	0.834	0.130	0.150	0.34E+00	-.13E+00	AS042d
7	-0.7610	-0.761	0.847	-.912	0.824	0.140	0.150	0.34E+00	-.73E-01	AS041d
8	0.7600	0.760	0.866	0.904	0.816	0.160	0.140	0.33E+00	0.92E-01	MIS22d
9	0.7590	0.759	0.867	0.895	0.831	0.170	0.150	0.34E+00	0.15E+00	PO030d
10	-0.7570	-0.757	0.852	-.916	0.802	0.140	0.140	0.34E+00	-.69E-01	SW002d
11	0.7430	0.743	0.848	0.900	0.802	0.150	0.150	0.35E+00	0.43E-01	A7E08d
12	-0.7430	-0.743	0.852	-.898	0.803	0.140	0.150	0.42E+00	-.12E+00	AF142d
13	0.7420	0.742	0.842	0.908	0.794	0.150	0.150	0.36E+00	-.92E-02	ATE08d
14	0.7420	0.742	0.852	0.910	0.781	0.150	0.140	0.41E+00	0.26E-01	MO61xd
15	0.7400	0.740	0.852	0.906	0.783	0.160	0.140	0.41E+00	0.93E-01	MOC5Td
16	-0.7390	-0.739	0.830	-.904	0.805	0.140	0.150	0.39E+00	-.11E+00	AnF08d
17	-0.7380	-0.738	0.847	-.897	0.799	0.140	0.150	0.42E+00	-.12E+00	AF23pd
18	-0.7380	-0.738	0.847	-.897	0.799	0.140	0.150	0.42E+00	-.12E+00	ATF08d
19	0.7340	0.734	0.834	0.898	0.801	0.140	0.150	0.41E+00	-.82E-01	AQF08d
20	0.7250	0.725	0.834	0.879	0.815	0.170	0.140	0.39E+00	0.19E+00	AO202d
21	0.7230	0.723	0.835	0.886	0.798	0.170	0.150	0.45E+00	0.64E-01	AO302d
22	0.7230	0.723	0.835	0.886	0.798	0.170	0.150	0.45E+00	0.64E-01	ATO08d
23	-0.7150	-0.715	0.823	-.907	0.754	0.130	0.140	0.39E+00	-.13E-01	AVH08d
24	0.7130	0.713	0.835	0.863	0.817	0.180	0.140	0.40E+00	0.24E+00	AO20qd
25	0.7120	0.712	0.864	0.845	0.822	0.180	0.140	0.42E+00	0.27E+00	AnO08d
26	0.7050	0.705	0.855	0.853	0.799	0.180	0.140	0.41E+00	0.24E+00	A4O08d
27	-0.7030	-0.703	0.825	-.875	0.782	0.120	0.150	0.41E+00	-.19E+00	AS040d
28	0.7000	0.700	0.808	0.892	0.761	0.160	0.150	0.42E+00	0.96E-01	MA021d
29	0.6790	0.679	0.803	0.873	0.753	0.160	0.140	0.50E+00	0.21E-01	AS000d
30	0.6670	0.667	0.843	0.854	0.725	0.170	0.140	0.46E+00	0.25E+00	MGR08d
31	0.6450	0.645	0.791	0.826	0.771	0.200	0.140	0.48E+00	0.32E+00	Gpo08d
32	-0.6270	-0.627	0.792	-.813	0.752	0.096	0.150	0.57E+00	-.41E+00	AS031d
33	0.5720	0.572	0.724	0.812	0.687	0.210	0.140	0.59E+00	0.35E+00	M4B08d
34	0.5710	0.571	0.765	0.783	0.695	0.210	0.140	0.55E+00	0.42E+00	ME082d
35	0.5530	0.553	0.719	0.801	0.663	0.200	0.140	0.57E+00	0.38E+00	MB011d
36	0.5490	0.549	0.759	0.759	0.691	0.230	0.140	0.62E+00	0.49E+00	SEV08d
37	0.5480	0.548	0.692	0.803	0.673	0.200	0.140	0.60E+00	0.33E+00	MEB08d
38	0.5460	0.546	0.684	0.802	0.677	0.200	0.140	0.60E+00	0.34E+00	M5B08d
39	0.5250	0.525	0.631	0.858	0.593	0.180	0.160	0.58E+00	0.85E-01	PMD08d
40	-0.5240	-0.524	0.674	-.827	0.595	0.120	0.160	0.88E+00	-.48E+00	MED08d
41	0.5190	0.519	0.681	0.769	0.669	0.220	0.140	0.62E+00	0.47E+00	M3B08d
42	0.5150	0.515	0.684	0.741	0.706	0.240	0.140	0.66E+00	0.56E+00	M2B08d
43	-0.5110	-0.511	0.646	-.833	0.581	0.130	0.140	0.11E+01	-.48E+00	M4D08d

44	**-0.4300**	**-0.430**	**0.560**	**-.787**	**0.534**	**0.077**	**0.140**	**0.99E+00**	**-.64E+00**	**M6D08d**
	NH1237_Am_w									
1	**-0.7370**	**-0.737**	**0.838**	**-.903**	**0.794**	**0.083**	**0.088**	**0.36E+00**	**-.73E-01**	**AnS08d**
2	-0.7360	-0.736	0.833	-.907	0.790	0.083	0.089	0.37E+00	-.82E-01	AS043d
3	-0.7360	-0.736	0.833	-.907	0.790	0.083	0.089	0.37E+00	-.82E-01	ATS08d
4	-0.7260	-0.726	0.847	-.898	0.771	0.083	0.091	0.37E+00	-.95E-01	AS042d
5	**0.7210**	**0.721**	**0.834**	**0.879**	**0.805**	**0.110**	**0.091**	**0.38E+00**	**0.16E+00**	**Mid08d**
6	-0.7160	-0.716	0.839	-.896	0.762	0.096	0.092	0.39E+00	-.68E-02	ATE08d
7	-0.7040	-0.704	0.820	-.900	0.745	0.092	0.090	0.39E+00	-.13E-02	A7E08d
8	0.6870	0.687	0.773	0.883	0.781	0.095	0.090	0.45E+00	0.62E-02	AO202d
9	0.6820	0.682	0.774	0.878	0.780	0.099	0.090	0.45E+00	0.46E-01	AO20qd
10	-0.6770	-0.677	0.811	-.866	0.752	0.078	0.089	0.55E+00	-.27E+00	AQF08d
11	0.6760	0.676	0.785	0.879	0.753	0.090	0.091	0.43E+00	-.31E-01	AS040d
12	**0.6690**	**0.669**	**0.779**	**0.873**	**0.754**	**0.100**	**0.091**	**0.53E+00**	**-.31E-01**	**AnO08d**
13	0.6690	0.669	0.770	0.877	0.756	0.097	0.091	0.49E+00	-.50E-01	AO302d
14	0.6690	0.669	0.770	0.877	0.756	0.097	0.091	0.49E+00	-.50E-01	ATO08d
15	0.6680	0.668	0.809	0.859	0.748	0.110	0.094	0.48E+00	0.11E+00	MOC6xd
16	0.6650	0.665	0.808	0.838	0.781	0.130	0.093	0.44E+00	0.28E+00	MIS22d
17	0.6640	0.664	0.775	0.860	0.769	0.120	0.091	0.45E+00	0.19E+00	A4O08d
18	-0.6630	-0.663	0.804	-.863	0.733	0.092	0.088	0.45E+00	-.70E-02	AS041d
19	0.6510	0.651	0.780	0.857	0.738	0.100	0.091	0.50E+00	0.31E-01	AS000d
20	-0.6450	-0.645	0.737	-.877	0.736	0.100	0.100	0.48E+00	-.93E-01	SW002d
21	0.6360	0.636	0.760	0.827	0.778	0.150	0.110	0.45E+00	0.32E+00	PO030d
22	-0.6320	-0.632	0.789	-.827	0.742	0.092	0.090	0.60E+00	-.20E+00	AF23pd
23	-0.6320	-0.632	0.789	-.827	0.742	0.092	0.090	0.60E+00	-.20E+00	ATF08d
24	-0.6310	-0.631	0.812	-.813	0.740	0.090	0.088	0.64E+00	-.24E+00	AF142d
25	-0.6220	-0.622	0.750	-.828	0.752	0.061	0.089	0.61E+00	-.36E+00	AS031d
26	0.6200	0.620	0.743	0.823	0.765	0.160	0.100	0.51E+00	0.36E+00	MA021d
27	**0.6170**	**0.617**	**0.711**	**0.855**	**0.734**	**0.110**	**0.091**	**0.51E+00**	**0.65E-01**	**AnF08d**
28	0.6090	0.609	0.782	0.797	0.748	0.150	0.090	0.59E+00	0.48E+00	MGR08d
29	0.6030	0.603	0.693	0.863	0.704	0.110	0.091	0.49E+00	0.15E+00	AVH08d
30	0.5990	0.599	0.725	0.842	0.697	0.110	0.090	0.54E+00	0.14E+00	M3B08d
31	**0.5950**	**0.595**	**0.745**	**0.827**	**0.693**	**0.110**	**0.092**	**0.56E+00**	**0.30E-01**	**MO61xd**
32	0.5700	0.570	0.756	0.804	0.665	0.150	0.093	0.61E+00	0.34E+00	MOC5Td
33	0.5680	0.568	0.716	0.825	0.662	0.100	0.079	0.57E+00	0.19E+00	MEB08d
34	0.5650	0.565	0.724	0.796	0.695	0.150	0.090	0.59E+00	0.39E+00	M2B08d
35	0.5520	0.552	0.736	0.797	0.652	0.140	0.089	0.67E+00	0.36E+00	M4B08d
36	**0.5480**	**0.548**	**0.726**	**0.806**	**0.637**	**0.130**	**0.083**	**0.65E+00**	**0.34E+00**	**M5B08d**
37	0.5420	0.542	0.673	0.779	0.720	0.150	0.093	0.60E+00	0.49E+00	MB011d
38	0.5230	0.523	0.673	0.767	0.690	0.190	0.110	0.63E+00	0.48E+00	PMD08d
39	0.4670	0.467	0.722	0.718	0.584	0.200	0.091	0.69E+00	0.60E+00	ME082d
40	**-0.4270**	**-0.427**	**0.588**	**-.808**	**0.476**	**0.130**	**0.085**	**0.12E+01**	**-.28E+00**	**M6D08d**
41	-0.4260	-0.426	0.594	-.837	0.437	0.110	0.081	0.88E+00	-.39E-01	MED08d
42	0.4090	0.409	0.566	0.793	0.472	0.190	0.083	0.12E+01	0.25E+00	M4D08d
	NH1237_Am_e									
1	**0.7920**	**0.792**	**0.888**	**0.921**	**0.832**	**0.150**	**0.150**	**0.30E+00**	**-.96E-02**	**Mid08d**
2	-0.7690	-0.769	0.860	-.903	0.845	0.140	0.160	0.34E+00	-.61E-01	AS043d
3	-0.7690	-0.769	0.860	-.903	0.845	0.140	0.160	0.34E+00	-.61E-01	ATS08d
4	**-0.7670**	**-0.767**	**0.860**	**-.901**	**0.842**	**0.150**	**0.160**	**0.33E+00**	**-.40E-01**	**AnS08d**
5	-0.7620	-0.762	0.859	-.895	0.844	0.140	0.160	0.35E+00	-.10E+00	AS042d
6	0.7260	0.726	0.862	0.895	0.764	0.160	0.160	0.37E+00	0.62E-01	MIS22d
7	-0.7030	-0.703	0.838	-.882	0.759	0.140	0.150	0.41E+00	-.20E-02	AS041d
8	**0.7020**	**0.702**	**0.821**	**0.881**	**0.773**	**0.150**	**0.140**	**0.41E+00**	**0.86E-01**	**AnO08d**
9	0.6980	0.698	0.801	0.872	0.801	0.170	0.160	0.41E+00	0.91E-01	A7E08d
10	-0.6930	-0.693	0.802	-.878	0.777	0.130	0.130	0.41E+00	-.20E-01	AO202d
11	-0.6890	-0.689	0.810	-.885	0.747	0.140	0.150	0.41E+00	0.11E-01	AS040d
12	0.6880	0.688	0.832	0.888	0.722	0.160	0.160	0.48E+00	0.11E-01	MOC5Td
13	0.6820	0.682	0.829	0.860	0.759	0.180	0.160	0.45E+00	0.16E+00	MGR08d
14	0.6820	0.682	0.853	0.834	0.784	0.170	0.120	0.40E+00	0.28E+00	PO030d
15	-0.6820	-0.682	0.818	-.880	0.734	0.100	0.110	0.45E+00	-.16E+00	SW002d
16	0.6800	0.680	0.789	0.877	0.761	0.140	0.130	0.42E+00	0.31E-01	AO20qd
17	-0.6790	-0.679	0.792	-.895	0.726	0.130	0.150	0.44E+00	-.74E-01	AVH08d
18	0.6760	0.676	0.790	0.874	0.757	0.170	0.160	0.44E+00	0.67E-01	ATE08d
19	-0.6740	-0.674	0.807	-.867	0.750	0.130	0.140	0.46E+00	-.68E-01	AQF08d
20	0.6710	0.671	0.853	0.883	0.677	0.140	0.150	0.49E+00	-.62E-01	MOC6xd
21	0.6660	0.666	0.824	0.858	0.730	0.170	0.140	0.45E+00	0.21E+00	A4O08d
22	0.6550	0.655	0.784	0.870	0.723	0.140	0.140	0.47E+00	0.77E-02	AO302d

23	0.6550	0.655	0.784	0.870	0.723	0.140	0.140	0.47E+00	0.77E-02	ATO08d
24	0.6340	0.634	0.801	0.812	0.762	0.240	0.180	0.49E+00	0.38E+00	ME082d
25	-0.6310	-0.631	0.791	-.854	0.691	0.140	0.140	0.50E+00	-.19E-01	AF142d
26	**0.6300**	**0.630**	**0.797**	**0.856**	**0.678**	**0.160**	**0.150**	**0.47E+00**	**0.13E+00**	**AnF08d**
27	0.6280	0.628	0.794	0.851	0.686	0.150	0.150	0.50E+00	0.19E-01	AF23pd
28	0.6280	0.628	0.794	0.851	0.686	0.150	0.150	0.50E+00	0.19E-01	ATF08d
29	0.6280	0.628	0.791	0.821	0.740	0.180	0.120	0.46E+00	0.32E+00	MA021d
30	0.6250	0.625	0.701	0.868	0.738	0.150	0.170	0.47E+00	0.49E-01	M3B08d
31	0.6240	0.624	0.764	0.837	0.727	0.190	0.160	0.49E+00	0.27E+00	MB011d
32	-0.6160	-0.616	0.792	-.859	0.649	0.130	0.140	0.55E+00	-.53E-01	AS000d
33	-0.6140	-0.614	0.772	-.828	0.712	0.094	0.140	0.56E+00	-.35E+00	AS031d
34	-0.6080	-0.608	0.722	-.866	0.681	0.130	0.140	0.53E+00	-.29E-02	MEB08d
35	0.6070	0.607	0.739	0.871	0.658	0.150	0.160	0.54E+00	0.18E-01	M4B08d
36	**0.6010**	**0.601**	**0.815**	**0.862**	**0.596**	**0.140**	**0.150**	**0.58E+00**	**-.63E-01**	**MO61xd**
37	0.5800	0.580	0.706	0.827	0.696	0.210	0.160	0.56E+00	0.27E+00	PMD08d
38	0.5780	0.578	0.701	0.820	0.708	0.180	0.170	0.53E+00	0.24E+00	M2B08d
39	**0.5670**	**0.567**	**0.703**	**0.847**	**0.638**	**0.140**	**0.140**	**0.57E+00**	**0.71E-01**	**M5B08d**
40	-0.5320	-0.532	0.637	-.852	0.612	0.140	0.170	0.10E+01	-.49E+00	M4D08d
41	-0.5270	-0.527	0.658	-.801	0.656	0.130	0.200	0.87E+00	-.55E+00	MED08d
42	**-0.4780**	**-0.478**	**0.571**	**-.769**	**0.676**	**0.073**	**0.130**	**0.10E+01**	**-.75E+00**	**M6D08d**
	NH1237_Af_w									
1	**0.8140**	**0.814**	**0.915**	**0.911**	**0.873**	**0.360**	**0.360**	**0.30E+00**	**0.61E-01**	**Mid08d**
2	**0.8100**	**0.810**	**0.917**	**0.906**	**0.872**	**0.390**	**0.370**	**0.31E+00**	**0.80E-01**	**AnS08d**
3	0.8040	0.804	0.912	0.906	0.862	0.390	0.360	0.34E+00	0.73E-01	AS043d
4	0.8040	0.804	0.912	0.906	0.862	0.390	0.360	0.34E+00	0.73E-01	ATS08d
5	0.8040	0.804	0.886	0.922	0.858	0.330	0.330	0.33E+00	0.17E-01	SW002d
6	0.8010	0.801	0.899	0.927	0.830	0.340	0.350	0.35E+00	0.40E-01	MOC6xd
7	0.7980	0.798	0.917	0.898	0.860	0.420	0.380	0.33E+00	0.10E+00	AS042d
8	0.7940	0.794	0.910	0.903	0.850	0.360	0.340	0.35E+00	0.42E-01	AO302d
9	0.7940	0.794	0.910	0.903	0.850	0.360	0.340	0.35E+00	0.42E-01	ATO08d
10	0.7900	0.790	0.904	0.896	0.861	0.370	0.350	0.33E+00	0.13E+00	MIS22d
11	0.7880	0.788	0.899	0.903	0.846	0.340	0.330	0.33E+00	0.55E-01	AO20qd
12	0.7880	0.788	0.896	0.904	0.847	0.370	0.360	0.36E+00	0.38E-01	ATE08d
13	0.7860	0.786	0.898	0.902	0.846	0.330	0.330	0.33E+00	0.25E-01	AO202d
14	0.7850	0.785	0.874	0.918	0.837	0.310	0.300	0.38E+00	0.40E-01	MOC5Td
15	**0.7840**	**0.784**	**0.885**	**0.917**	**0.825**	**0.370**	**0.350**	**0.37E+00**	**0.88E-01**	**MO61xd**
16	0.7830	0.783	0.901	0.894	0.851	0.430	0.380	0.35E+00	0.13E+00	AS041d
17	0.7810	0.781	0.896	0.895	0.849	0.400	0.360	0.36E+00	0.10E+00	AS040d
18	0.7760	0.776	0.885	0.899	0.844	0.350	0.350	0.37E+00	0.49E-01	A7E08d
19	-0.7730	-0.773	0.890	-.894	0.842	0.330	0.370	0.39E+00	-.15E+00	AS031d
20	**0.7720**	**0.772**	**0.903**	**0.873**	**0.867**	**0.410**	**0.330**	**0.37E+00**	**0.22E+00**	**AnO08d**
21	0.7620	0.762	0.893	0.887	0.827	0.440	0.380	0.38E+00	0.13E+00	AS000d
22	-0.7590	-0.759	0.878	-.891	0.827	0.260	0.300	0.39E+00	-.11E+00	AQF08d
23	0.7590	0.759	0.876	0.874	0.860	0.300	0.280	0.39E+00	0.20E+00	MA021d
24	0.7560	0.756	0.909	0.860	0.851	0.300	0.240	0.37E+00	0.24E+00	PO030d
25	**-0.7540**	**-0.754**	**0.880**	**-.887**	**0.820**	**0.260**	**0.290**	**0.44E+00**	**-.13E+00**	**AnF08d**
26	-0.7420	-0.742	0.887	-.880	0.801	0.260	0.300	0.46E+00	-.15E+00	AF23pd
27	-0.7420	-0.742	0.887	-.880	0.801	0.260	0.300	0.46E+00	-.15E+00	ATF08d
28	0.7420	0.742	0.868	0.896	0.790	0.380	0.370	0.39E+00	0.10E+00	Gpo08d
29	-0.7380	-0.738	0.887	-.878	0.797	0.240	0.270	0.45E+00	-.12E+00	AF142d
30	0.7210	0.721	0.854	0.879	0.788	0.340	0.350	0.44E+00	0.32E-01	A4O08d
31	0.7110	0.711	0.850	0.865	0.794	0.430	0.360	0.43E+00	0.22E+00	MGR08d
32	0.7040	0.704	0.813	0.874	0.798	0.280	0.290	0.43E+00	0.11E+00	ME082d
33	-0.6750	-0.675	0.774	-.879	0.760	0.320	0.360	0.47E+00	-.34E-01	M4B08d
34	**-0.6650**	**-0.665**	**0.767**	**-.871**	**0.761**	**0.310**	**0.340**	**0.48E+00**	**-.17E-01**	**M5B08d**
35	-0.6470	-0.647	0.770	-.872	0.715	0.330	0.360	0.53E+00	-.39E-01	AVH08d
36	0.6410	0.641	0.713	0.864	0.770	0.390	0.370	0.51E+00	0.14E+00	M3B08d
37	0.6320	0.632	0.716	0.852	0.769	0.390	0.370	0.52E+00	0.19E+00	M2B08d
38	-0.6260	-0.626	0.729	-.857	0.733	0.270	0.340	0.56E+00	-.17E+00	MEB08d
39	-0.6140	-0.614	0.766	-.822	0.730	0.200	0.350	0.59E+00	-.30E+00	MB011d
40	0.6040	0.604	0.763	0.789	0.766	0.270	0.170	0.67E+00	0.55E+00	SEV08d
41	-0.5600	-0.560	0.678	-.844	0.651	0.250	0.340	0.67E+00	-.19E+00	PMD08d
42	**-0.5530**	**-0.553**	**0.610**	**-.835**	**0.719**	**0.250**	**0.330**	**0.89E+00**	**-.49E+00**	**M6D08d**
43	-0.5520	-0.552	0.644	-.864	0.633	0.350	0.370	0.84E+00	-.24E+00	M4D08d
44	-0.5220	-0.522	0.649	-.843	0.591	0.320	0.420	0.72E+00	-.30E+00	MED08d
	NH1237_Af_e									
1	0.8170	0.817	0.927	0.895	0.899	0.330	0.280	0.25E+00	0.15E+00	PO030d

2	0.8050	0.805	0.914	0.907	0.861	0.300	0.280	0.28E+00	0.10E+00	Mid08d
3	0.7850	0.785	0.907	0.887	0.865	0.320	0.280	0.31E+00	0.16E+00	MIS22d
4	0.7780	0.778	0.875	0.900	0.855	0.350	0.330	0.33E+00	-.92E-02	AQF08d
5	0.7750	0.775	0.878	0.886	0.870	0.360	0.310	0.33E+00	0.17E+00	MA021d
6	0.7740	0.774	0.868	0.897	0.859	0.320	0.310	0.33E+00	0.86E-01	AO202d
7	0.7720	0.772	0.874	0.889	0.863	0.340	0.310	0.33E+00	0.12E+00	AO20qd
8	0.7680	0.768	0.893	0.874	0.865	0.330	0.280	0.32E+00	0.19E+00	MOC5Td
9	-0.7610	-0.761	0.852	-.897	0.844	0.300	0.310	0.37E+00	-.88E-01	AnF08d
10	0.7600	0.760	0.848	0.894	0.853	0.350	0.330	0.35E+00	0.11E+00	Gpo08d
11	-0.7580	-0.758	0.865	-.889	0.840	0.340	0.330	0.36E+00	-.42E-01	AF23pd
12	0.7580	0.758	0.860	0.883	0.856	0.350	0.330	0.33E+00	0.13E+00	AnS08d
13	0.7580	0.758	0.867	0.886	0.845	0.350	0.320	0.37E+00	0.10E+00	AO302d
14	-0.7580	-0.758	0.865	-.889	0.840	0.340	0.330	0.36E+00	-.42E-01	ATF08d
15	0.7580	0.758	0.867	0.886	0.845	0.350	0.320	0.37E+00	0.10E+00	ATO08d
16	0.7570	0.757	0.855	0.887	0.853	0.330	0.320	0.33E+00	-.24E-01	AF142d
17	0.7540	0.754	0.877	0.877	0.843	0.340	0.310	0.34E+00	0.12E+00	ATE08d
18	0.7510	0.751	0.858	0.884	0.841	0.340	0.330	0.36E+00	0.79E-01	AS042d
19	0.7490	0.749	0.830	0.904	0.827	0.320	0.300	0.35E+00	0.73E-01	SW002d
20	-0.7450	-0.745	0.879	-.881	0.813	0.270	0.320	0.43E+00	-.20E+00	AS031d
21	0.7440	0.744	0.846	0.880	0.845	0.340	0.320	0.37E+00	0.11E+00	AS041d
22	0.7400	0.740	0.845	0.872	0.852	0.360	0.310	0.36E+00	0.18E+00	A7E08d
23	0.7400	0.740	0.859	0.880	0.824	0.340	0.300	0.37E+00	0.18E+00	MOC6xd
24	0.7380	0.738	0.851	0.873	0.839	0.370	0.330	0.37E+00	0.17E+00	AS043d
25	0.7380	0.738	0.851	0.873	0.839	0.370	0.330	0.37E+00	0.17E+00	ATS08d
26	0.7330	0.733	0.871	0.844	0.864	0.390	0.300	0.41E+00	0.31E+00	AnO08d
27	0.7320	0.732	0.864	0.857	0.845	0.390	0.320	0.41E+00	0.22E+00	AS000d
28	0.7290	0.729	0.835	0.888	0.807	0.340	0.310	0.42E+00	0.16E+00	MO61xd
29	0.7260	0.726	0.864	0.881	0.787	0.300	0.320	0.42E+00	-.15E-01	AS040d
30	0.7220	0.722	0.847	0.863	0.827	0.350	0.320	0.39E+00	0.16E+00	A4O08d
31	0.7050	0.705	0.854	0.865	0.778	0.280	0.260	0.39E+00	0.17E+00	ME082d
32	-0.7040	-0.704	0.783	-.882	0.815	0.320	0.320	0.41E+00	-.78E-02	AVH08d
33	0.7030	0.703	0.788	0.891	0.792	0.290	0.300	0.42E+00	0.46E-01	MGR08d
34	0.6850	0.685	0.844	0.823	0.821	0.260	0.180	0.45E+00	0.37E+00	SEV08d
35	-0.6440	-0.644	0.749	-.854	0.760	0.230	0.310	0.49E+00	-.10E+00	MB011d
36	0.6250	0.625	0.726	0.873	0.708	0.310	0.300	0.53E+00	0.11E+00	M5B08d
37	0.6200	0.620	0.666	0.884	0.738	0.290	0.290	0.50E+00	0.54E-01	PMD08d
38	0.5910	0.591	0.686	0.864	0.681	0.320	0.320	0.56E+00	0.11E+00	M4B08d
39	0.5790	0.579	0.710	0.847	0.657	0.350	0.280	0.62E+00	0.18E+00	MEB08d
40	0.5760	0.576	0.658	0.843	0.710	0.390	0.310	0.56E+00	0.27E+00	M3B08d
41	0.5700	0.570	0.649	0.834	0.718	0.390	0.310	0.55E+00	0.32E+00	M2B08d
42	0.5390	0.539	0.642	0.852	0.623	0.350	0.320	0.75E+00	-.11E+00	MED08d
43	0.5350	0.535	0.647	0.831	0.642	0.350	0.300	0.84E+00	-.71E-01	M4D08d
44	-0.5050	-0.505	0.650	-.795	0.620	0.290	0.300	0.82E+00	-.25E+00	M6D08d
	NH1237_As_n									
1	0.7880	0.788	0.879	0.897	0.878	0.270	0.300	0.30E+00	-.29E-01	Mid08d
2	0.7630	0.763	0.826	0.914	0.844	0.390	0.370	0.27E+00	-.90E-02	Gpo08d
3	-0.7510	-0.751	0.816	-.896	0.860	0.270	0.300	0.35E+00	-.59E-01	AS043d
4	-0.7510	-0.751	0.816	-.896	0.860	0.270	0.300	0.35E+00	-.59E-01	ATS08d
5	-0.7490	-0.749	0.822	-.898	0.847	0.280	0.300	0.35E+00	-.49E-01	AnS08d
6	0.7430	0.743	0.866	0.875	0.833	0.270	0.310	0.37E+00	0.25E-01	MIS22d
7	0.7380	0.738	0.839	0.885	0.828	0.330	0.290	0.40E+00	0.18E+00	MOC5Td
8	0.7300	0.730	0.763	0.909	0.846	0.300	0.290	0.38E+00	0.16E-01	AnO08d
9	0.7300	0.730	0.839	0.884	0.812	0.290	0.300	0.41E+00	0.42E-01	MOC6xd
10	-0.7250	-0.725	0.818	-.874	0.843	0.290	0.350	0.38E+00	-.11E+00	AS041d
11	0.7220	0.722	0.834	0.889	0.792	0.300	0.300	0.45E+00	0.52E-01	MO61xd
12	-0.7180	-0.718	0.790	-.885	0.834	0.260	0.320	0.37E+00	-.14E+00	AS042d
13	-0.7100	-0.710	0.814	-.882	0.796	0.270	0.310	0.42E+00	-.91E-01	AVH08d
14	0.7060	0.706	0.805	0.865	0.829	0.320	0.290	0.39E+00	0.14E+00	A4O08d
15	-0.7000	-0.700	0.776	-.875	0.824	0.310	0.340	0.41E+00	-.29E-01	A7E08d
16	0.6990	0.699	0.779	0.867	0.834	0.390	0.360	0.46E+00	0.92E-01	M5B08d
17	-0.6890	-0.689	0.772	-.864	0.824	0.270	0.340	0.44E+00	-.87E-01	AS040d
18	-0.6880	-0.688	0.815	-.856	0.792	0.300	0.330	0.46E+00	-.61E-01	AnF08d
19	0.6880	0.688	0.809	0.877	0.760	0.190	0.230	0.45E+00	-.12E+00	SW002d
20	-0.6800	-0.680	0.771	-.865	0.802	0.250	0.250	0.47E+00	-.10E+00	AO20qd
21	-0.6800	-0.680	0.786	-.869	0.778	0.250	0.320	0.47E+00	-.21E+00	AQF08d
22	0.6800	0.680	0.802	0.847	0.803	0.360	0.320	0.44E+00	0.25E+00	ME082d
23	0.6800	0.680	0.836	0.837	0.790	0.240	0.200	0.42E+00	0.25E+00	PO030d

24	0.6780	0.678	0.792	0.862	0.782	0.280	0.280	0.50E+00	0.82E-01	MGR08d
25	-0.6750	-0.675	0.765	-.856	0.813	0.350	0.360	0.49E+00	-.35E-01	MEB08d
26	0.6720	0.672	0.749	0.877	0.784	0.350	0.310	0.47E+00	0.70E-01	M4B08d
27	-0.6710	-0.671	0.766	-.854	0.807	0.270	0.330	0.48E+00	-.11E+00	AF142d
28	-0.6700	-0.670	0.777	-.862	0.779	0.230	0.240	0.51E+00	-.12E+00	AO302d
29	-0.6700	-0.670	0.777	-.862	0.779	0.230	0.240	0.51E+00	-.12E+00	ATO08d
30	-0.6680	-0.668	0.769	-.853	0.797	0.240	0.250	0.48E+00	-.14E+00	AO202d
31	-0.6660	-0.666	0.775	-.848	0.797	0.250	0.300	0.45E+00	-.70E-01	ATE08d
32	-0.6650	-0.665	0.774	-.849	0.790	0.280	0.320	0.48E+00	-.79E-01	AF23pd
33	-0.6650	-0.665	0.774	-.849	0.790	0.280	0.320	0.48E+00	-.79E-01	ATF08d
34	0.6410	0.641	0.742	0.857	0.755	0.290	0.310	0.48E+00	0.37E-01	MB011d
35	0.6370	0.637	0.763	0.823	0.785	0.300	0.220	0.49E+00	0.35E+00	MA021d
36	0.6350	0.635	0.695	0.874	0.761	0.320	0.300	0.50E+00	0.98E-01	M3B08d
37	-0.6260	-0.626	0.736	-.817	0.799	0.170	0.260	0.58E+00	-.38E+00	AS031d
38	0.6200	0.620	0.700	0.851	0.759	0.340	0.300	0.54E+00	0.25E+00	M2B08d
39	-0.6130	-0.613	0.731	-.820	0.765	0.210	0.260	0.56E+00	-.12E+00	AS000d
40	0.5500	0.550	0.611	0.834	0.713	0.260	0.210	0.60E+00	0.22E+00	PMD08d
41	-0.5280	-0.528	0.729	-.715	0.749	0.180	0.480	0.11E+01	-.97E+00	MED08d
42	-0.4970	-0.497	0.665	-.757	0.648	0.180	0.400	0.11E+01	-.88E+00	M4D08d
43	**-0.4560**	**-0.456**	**0.616**	**-.722**	**0.648**	**0.140**	**0.310**	**0.11E+01**	**-.87E+00**	**M6D08d**
	NH1237_As_s									
1	**0.8180**	**0.818**	**0.913**	**0.925**	**0.855**	**0.610**	**0.590**	**0.29E+00**	**0.77E-01**	**AnO08d**
2	-0.8090	-0.809	0.889	-.925	0.861	0.550	0.550	0.30E+00	0.77E-02	A7E08d
3	-0.8080	-0.808	0.896	-.921	0.859	0.520	0.570	0.32E+00	-.68E-01	A4O08d
4	-0.7960	-0.796	0.876	-.919	0.857	0.500	0.530	0.32E+00	-.34E-01	ATE08d
5	0.7940	0.794	0.887	0.914	0.850	0.560	0.540	0.31E+00	0.54E-01	AS043d
6	0.7940	0.794	0.887	0.914	0.850	0.560	0.540	0.31E+00	0.54E-01	ATS08d
7	**0.7920**	**0.792**	**0.883**	**0.912**	**0.853**	**0.570**	**0.540**	**0.32E+00**	**0.65E-01**	**AnS08d**
8	-0.7840	-0.784	0.861	-.918	0.848	0.530	0.550	0.31E+00	-.13E-01	AS042d
9	-0.7830	-0.783	0.864	-.916	0.846	0.530	0.550	0.31E+00	-.91E-02	AS041d
10	**-0.7820**	**-0.782**	**0.876**	**-.886**	**0.889**	**0.480**	**0.610**	**0.34E+00**	**-.20E+00**	**Mid08d**
11	-0.7770	-0.777	0.855	-.906	0.860	0.390	0.450	0.32E+00	-.16E+00	AO302d
12	-0.7770	-0.777	0.838	-.918	0.854	0.530	0.540	0.32E+00	0.44E-02	AS040d
13	-0.7770	-0.777	0.855	-.906	0.860	0.390	0.450	0.32E+00	-.16E+00	ATO08d
14	0.7770	0.777	0.866	0.912	0.837	0.470	0.490	0.39E+00	0.19E-01	M4B08d
15	**-0.7720**	**-0.772**	**0.890**	**-.895**	**0.835**	**0.490**	**0.560**	**0.44E+00**	**-.14E+00**	**AnF08d**
16	-0.7710	-0.771	0.871	-.904	0.834	0.450	0.530	0.40E+00	-.11E+00	MOC6xd
17	-0.7660	-0.766	0.890	-.884	0.843	0.430	0.540	0.45E+00	-.22E+00	AF142d
18	-0.7640	-0.764	0.865	-.894	0.844	0.400	0.460	0.32E+00	-.16E+00	AO202d
19	-0.7620	-0.762	0.857	-.898	0.840	0.410	0.460	0.31E+00	-.11E+00	AO20qd
20	-0.7620	-0.762	0.865	-.907	0.817	0.610	0.670	0.40E+00	0.22E-01	Gpo08d
21	-0.7600	-0.760	0.891	-.879	0.841	0.460	0.560	0.46E+00	-.21E+00	AF23pd
22	-0.7600	-0.760	0.891	-.879	0.841	0.460	0.560	0.46E+00	-.21E+00	ATF08d
23	**0.7600**	**0.760**	**0.852**	**0.897**	**0.842**	**0.490**	**0.490**	**0.42E+00**	**0.79E-01**	**M5B08d**
24	-0.7570	-0.757	0.868	-.889	0.836	0.470	0.570	0.44E+00	-.20E+00	AQF08d
25	0.7570	0.757	0.863	0.906	0.808	0.490	0.490	0.45E+00	0.36E-01	MOC5Td
26	**-0.7530**	**-0.753**	**0.852**	**-.909**	**0.806**	**0.470**	**0.490**	**0.45E+00**	**-.24E-02**	**MO61xd**
27	-0.7480	-0.748	0.847	-.868	0.877	0.450	0.570	0.37E+00	-.19E+00	MIS22d
28	-0.7440	-0.744	0.842	-.891	0.828	0.490	0.500	0.41E+00	-.82E-02	MEB08d
29	0.7140	0.714	0.822	0.869	0.823	0.450	0.460	0.45E+00	0.19E-01	MGR08d
30	-0.7130	-0.713	0.832	-.878	0.794	0.490	0.530	0.47E+00	-.51E-01	AVH08d
31	-0.7110	-0.711	0.843	-.837	0.855	0.340	0.470	0.41E+00	-.33E+00	AS031d
32	-0.7110	-0.711	0.816	-.863	0.833	0.430	0.560	0.45E+00	-.26E+00	SW002d
33	-0.7010	-0.701	0.838	-.838	0.834	0.340	0.470	0.44E+00	-.36E+00	AS000d
34	-0.6910	-0.691	0.815	-.865	0.782	0.430	0.490	0.49E+00	0.31E-01	ME082d
35	-0.6380	-0.638	0.703	-.868	0.770	0.380	0.500	0.56E+00	-.10E+00	M3B08d
36	-0.6330	-0.633	0.691	-.868	0.768	0.380	0.500	0.55E+00	-.99E-01	M2B08d
37	-0.6120	-0.612	0.750	-.830	0.724	0.320	0.510	0.73E+00	-.41E+00	PMD08d
38	**-0.5860**	**-0.586**	**0.826**	**-.749**	**0.741**	**0.310**	**0.560**	**0.75E+00**	**-.63E+00**	**M6D08d**
39	-0.5610	-0.561	0.683	-.814	0.695	0.380	0.500	0.69E+00	-.13E+00	MB011d
40	-0.5590	-0.559	0.716	-.806	0.673	0.310	0.510	0.88E+00	-.61E+00	M4D08d
41	-0.5320	-0.532	0.594	-.803	0.739	0.300	0.570	0.96E+00	-.69E+00	MED08d
	EQ1220_Amer									
1	**-0.7630**	**-0.763**	**0.876**	**-.882**	**0.854**	**0.150**	**0.180**	**0.35E+00**	**-.18E+00**	**Mid08d**
2	-0.7240	-0.724	0.843	-.879	0.804	0.170	0.190	0.50E+00	-.16E+00	MOC5Td
3	-0.7100	-0.710	0.862	-.847	0.814	0.140	0.190	0.47E+00	-.28E+00	MIS22d
4	-0.6950	-0.695	0.782	-.900	0.762	0.180	0.200	0.46E+00	-.11E+00	AQF08d

5	-0.6940	-0.694	0.783	-.889	0.779	0.160	0.180	0.44E+00	-.76E-01	A4O08d
6	-0.6930	-0.693	0.793	-.889	0.767	0.150	0.170	0.43E+00	-.92E-01	AO202d
7	-0.6920	-0.692	0.856	-.839	0.795	0.140	0.180	0.57E+00	-.40E+00	MOC6xd
8	-0.6910	-0.691	0.781	-.881	0.788	0.160	0.200	0.47E+00	-.21E+00	AF142d
9	0.6880	0.688	0.821	0.871	0.760	0.210	0.180	0.47E+00	0.14E+00	MGR08d
10	-0.6850	-0.685	0.795	-.881	0.760	0.190	0.200	0.49E+00	0.79E-02	MEB08d
11	-0.6820	-0.682	0.788	-.888	0.749	0.160	0.170	0.44E+00	-.43E-01	AO20qd
12	-0.6750	-0.675	0.807	-.831	0.817	0.190	0.230	0.61E+00	-.41E+00	SW002d
13	**-0.6720**	**-0.672**	**0.807**	**-.885**	**0.716**	**0.200**	**0.230**	**0.50E+00**	**-.71E-01**	**M5B08d**
14	0.6710	0.671	0.767	0.848	0.815	0.230	0.200	0.46E+00	0.24E+00	A7E08d
15	-0.6700	-0.670	0.757	-.890	0.749	0.170	0.190	0.48E+00	-.93E-01	AF23pd
16	-0.6700	-0.670	0.757	-.890	0.749	0.170	0.190	0.48E+00	-.93E-01	ATF08d
17	0.6650	0.665	0.758	0.859	0.789	0.210	0.190	0.46E+00	0.14E+00	ATE08d
18	-0.6550	-0.655	0.794	-.858	0.732	0.130	0.170	0.55E+00	-.29E+00	AVH08d
19	-0.6530	-0.653	0.778	-.884	0.703	0.170	0.190	0.53E+00	-.11E+00	M4B08d
20	0.6310	0.631	0.808	0.863	0.661	0.220	0.200	0.49E+00	0.13E+00	AS041d
21	-0.6290	-0.629	0.769	-.862	0.691	0.150	0.180	0.56E+00	-.19E+00	AS031d
22	**-0.6290**	**-0.629**	**0.840**	**-.850**	**0.652**	**0.140**	**0.180**	**0.58E+00**	**-.30E+00**	**MO61xd**
23	-0.6280	-0.628	0.752	-.872	0.691	0.180	0.180	0.48E+00	-.12E-02	AO302d
24	-0.6280	-0.628	0.780	-.836	0.722	0.140	0.180	0.55E+00	-.25E+00	AS000d
25	-0.6280	-0.628	0.752	-.872	0.691	0.180	0.180	0.48E+00	-.12E-02	ATO08d
26	0.6240	0.624	0.807	0.861	0.652	0.230	0.200	0.50E+00	0.14E+00	AS042d
27	**0.6230**	**0.623**	**0.731**	**0.869**	**0.703**	**0.190**	**0.190**	**0.50E+00**	**0.12E-01**	**AnF08d**
28	0.6210	0.621	0.728	0.868	0.701	0.200	0.190	0.57E+00	0.37E-01	M3B08d
29	0.6200	0.620	0.726	0.867	0.704	0.200	0.180	0.57E+00	0.44E-01	M2B08d
30	0.6140	0.614	0.813	0.822	0.687	0.270	0.200	0.56E+00	0.32E+00	AS043d
31	0.6140	0.614	0.813	0.822	0.687	0.270	0.200	0.56E+00	0.32E+00	ATS08d
32	**0.6100**	**0.610**	**0.819**	**0.816**	**0.682**	**0.270**	**0.200**	**0.59E+00**	**0.33E+00**	**AnS08d**
33	**0.6040**	**0.604**	**0.762**	**0.814**	**0.722**	**0.250**	**0.170**	**0.68E+00**	**0.39E+00**	**AnO08d**
34	0.6020	0.602	0.783	0.857	0.632	0.220	0.190	0.52E+00	0.16E+00	AS040d
35	-0.6010	-0.601	0.665	-.805	0.839	0.098	0.150	0.75E+00	-.61E+00	MA021d
36	0.5990	0.599	0.745	0.831	0.698	0.260	0.200	0.55E+00	0.34E+00	ME082d
37	0.5760	0.576	0.696	0.853	0.656	0.210	0.210	0.59E+00	0.83E-01	PMD08d
38	0.5490	0.549	0.742	0.805	0.627	0.270	0.180	0.66E+00	0.35E+00	MB011d
39	-0.5470	-0.547	0.672	-.836	0.637	0.210	0.250	0.87E+00	-.32E+00	MED08d
40	**-0.5430**	**-0.543**	**0.728**	**-.836**	**0.580**	**0.150**	**0.200**	**0.90E+00**	**-.37E+00**	**M6D08d**
41	-0.5380	-0.538	0.669	-.824	0.636	0.220	0.180	0.11E+01	-.24E+00	M4D08d
	EQ1220_Afri									
1	**-0.8200**	**-0.820**	**0.891**	**-.922**	**0.888**	**0.240**	**0.250**	**0.32E+00**	**-.15E-01**	**AnS08d**
2	-0.8200	-0.820	0.899	-.915	0.893	0.230	0.250	0.33E+00	-.53E-01	AS043d
3	-0.8200	-0.820	0.899	-.915	0.893	0.230	0.250	0.33E+00	-.53E-01	ATS08d
4	**-0.8160**	**-0.816**	**0.914**	**-.900**	**0.898**	**0.250**	**0.290**	**0.32E+00**	**-.41E-01**	**Mid08d**
5	0.8110	0.811	0.911	0.916	0.859	0.220	0.200	0.34E+00	0.16E+00	MA021d
6	**0.8080**	**0.808**	**0.851**	**0.924**	**0.899**	**0.270**	**0.270**	**0.38E+00**	**-.12E-01**	**AnO08d**
7	-0.8040	-0.804	0.926	-.896	0.869	0.270	0.320	0.35E+00	0.35E-01	MIS22d
8	0.8010	0.801	0.939	0.894	0.854	0.230	0.190	0.30E+00	0.20E+00	PO030d
9	0.7880	0.788	0.906	0.900	0.845	0.390	0.380	0.35E+00	0.93E-01	Gpo08d
10	-0.7820	-0.782	0.928	-.884	0.842	0.300	0.350	0.41E+00	-.12E+00	MOC6xd
11	-0.7760	-0.776	0.875	-.887	0.873	0.250	0.290	0.38E+00	-.99E-01	A7E08d
12	-0.7730	-0.773	0.880	-.878	0.883	0.210	0.250	0.42E+00	-.18E+00	ATE08d
13	**-0.7720**	**-0.772**	**0.922**	**-.876**	**0.843**	**0.280**	**0.310**	**0.45E+00**	**-.15E+00**	**MO61xd**
14	0.7670	0.767	0.925	0.868	0.844	0.270	0.230	0.38E+00	0.20E+00	MGR08d
15	-0.7620	-0.762	0.878	-.884	0.846	0.160	0.180	0.42E+00	-.17E+00	AO20qd
16	-0.7610	-0.761	0.907	-.878	0.827	0.250	0.290	0.45E+00	-.11E+00	MOC5Td
17	-0.7590	-0.759	0.870	-.882	0.851	0.150	0.180	0.43E+00	-.19E+00	AO202d
18	-0.7550	-0.755	0.867	-.882	0.846	0.160	0.180	0.44E+00	-.16E+00	AO302d
19	-0.7550	-0.755	0.867	-.882	0.846	0.160	0.180	0.44E+00	-.16E+00	ATO08d
20	-0.7550	-0.755	0.901	-.867	0.842	0.190	0.260	0.46E+00	-.31E+00	SW002d
21	-0.7510	-0.751	0.883	-.884	0.817	0.260	0.290	0.42E+00	-.67E-01	M3B08d
22	-0.7410	-0.741	0.883	-.871	0.820	0.340	0.410	0.48E+00	-.23E+00	AVH08d
23	-0.7370	-0.737	0.881	-.867	0.822	0.280	0.290	0.44E+00	0.15E-01	M2B08d
24	-0.7330	-0.733	0.885	-.863	0.815	0.200	0.270	0.50E+00	-.27E+00	MEB08d
25	-0.7320	-0.732	0.889	-.842	0.849	0.220	0.260	0.49E+00	-.14E+00	A4O08d
26	-0.7310	-0.731	0.887	-.860	0.814	0.220	0.310	0.50E+00	-.28E+00	M4B08d
27	**-0.7290**	**-0.729**	**0.874**	**-.858**	**0.826**	**0.200**	**0.270**	**0.50E+00**	**-.29E+00**	**M5B08d**
28	-0.7200	-0.720	0.828	-.860	0.849	0.180	0.270	0.48E+00	-.27E+00	AS042d
29	-0.7180	-0.718	0.848	-.846	0.850	0.230	0.300	0.49E+00	-.27E+00	AQF08d

30	-0.7100	-0.710	0.830	-.848	0.843	0.200	0.280	0.49E+00	-.22E+00	AF142d
31	-0.7070	-0.707	0.837	-.843	0.840	0.240	0.290	0.48E+00	-.15E+00	AF23pd
32	-0.7070	-0.707	0.837	-.843	0.840	0.240	0.290	0.48E+00	-.15E+00	ATF08d
33	**-0.7010**	**-0.701**	**0.827**	**-.840**	**0.843**	**0.240**	**0.260**	**0.50E+00**	**-.26E-01**	**AnF08d**
34	0.6840	0.684	0.825	0.847	0.790	0.300	0.280	0.50E+00	0.24E+00	ME082d
35	-0.6830	-0.683	0.778	-.845	0.842	0.190	0.300	0.52E+00	-.33E+00	AS041d
36	-0.6710	-0.671	0.752	-.863	0.805	0.200	0.270	0.53E+00	-.24E+00	AS040d
37	0.6570	0.657	0.764	0.876	0.736	0.250	0.270	0.54E+00	-.23E-02	PMD08d
38	-0.6360	-0.636	0.768	-.790	0.843	0.140	0.190	0.65E+00	-.38E+00	AS000d
39	-0.6350	-0.635	0.776	-.786	0.841	0.110	0.190	0.69E+00	-.58E+00	AS031d
40	0.6070	0.607	0.753	0.838	0.695	0.260	0.300	0.65E+00	0.81E-01	MB011d
41	-0.5750	-0.575	0.747	-.824	0.652	0.290	0.330	0.98E+00	-.33E+00	M4D08d
42	-0.5320	-0.532	0.652	-.800	0.677	0.180	0.320	0.93E+00	-.53E+00	MED08d
43	**-0.5260**	**-0.526**	**0.715**	**-.787**	**0.625**	**0.110**	**0.210**	**0.10E+01**	**-.74E+00**	**M6D08d**
	EQ1220_Indo									
1	**0.8100**	**0.810**	**0.866**	**0.936**	**0.000**	**0.280**	**0.260**	**0.29E+00**	**0.82E-01**	**AnO08d**
2	0.7860	0.786	0.850	0.928	0.845	0.250	0.240	0.34E+00	-.26E-01	AO202d
3	0.7840	0.784	0.833	0.927	0.858	0.260	0.240	0.34E+00	0.11E-01	AO20qd
4	-0.7630	-0.763	0.840	-.909	0.000	0.220	0.240	0.33E+00	-.11E+00	AS041d
5	**0.7610**	**0.761**	**0.833**	**0.913**	**0.000**	**0.290**	**0.250**	**0.32E+00**	**0.14E+00**	**AnF08d**
6	0.7530	0.753	0.789	0.917	0.856	0.280	0.250	0.35E+00	0.13E+00	MGR08d
7	0.7500	0.750	0.830	0.905	0.827	0.300	0.260	0.37E+00	0.11E+00	AO302d
8	0.7500	0.750	0.830	0.905	0.827	0.300	0.260	0.37E+00	0.11E+00	ATO08d
9	0.7470	0.747	0.857	0.900	0.805	0.290	0.250	0.34E+00	0.17E+00	A4O08d
10	0.7470	0.747	0.841	0.894	0.830	0.290	0.250	0.34E+00	0.16E+00	AF23pd
11	0.7470	0.747	0.841	0.894	0.830	0.290	0.250	0.34E+00	0.16E+00	ATF08d
12	-0.7440	-0.744	0.822	-.903	0.826	0.230	0.240	0.35E+00	-.68E-01	AQF08d
13	-0.7400	-0.740	0.840	-.881	0.000	0.200	0.240	0.38E+00	-.17E+00	AS042d
14	0.7370	0.737	0.810	0.911	0.000	0.250	0.240	0.36E+00	0.74E-01	AS000d
15	0.7370	0.737	0.818	0.902	0.815	0.260	0.240	0.33E+00	0.10E+00	MOC6xd
16	**-0.7340**	**-0.734**	**0.849**	**-.865**	**0.000**	**0.240**	**0.270**	**0.34E+00**	**-.71E-01**	**Mid08d**
17	-0.7290	-0.729	0.807	-.906	0.802	0.250	0.250	0.34E+00	0.17E-01	AVH08d
18	**-0.7220**	**-0.722**	**0.843**	**-.900**	**0.764**	**0.240**	**0.250**	**0.34E+00**	**-.50E-01**	**AnS08d**
19	0.7090	0.709	0.832	0.882	0.777	0.280	0.250	0.38E+00	0.17E+00	A7E08d
20	0.7090	0.709	0.801	0.889	0.793	0.300	0.250	0.38E+00	0.19E+00	PO030d
21	-0.7080	-0.708	0.847	-.897	0.736	0.230	0.250	0.34E+00	-.53E-01	AS043d
22	-0.7080	-0.708	0.847	-.897	0.736	0.230	0.250	0.34E+00	-.53E-01	ATS08d
23	0.7060	0.706	0.818	0.894	0.763	0.270	0.240	0.39E+00	0.13E+00	MOC5Td
24	**0.6870**	**0.687**	**0.822**	**0.862**	**0.774**	**0.290**	**0.230**	**0.40E+00**	**0.26E+00**	**MO61xd**
25	0.6740	0.674	0.775	0.872	0.771	0.210	0.200	0.40E+00	0.93E-01	SW002d
26	-0.6680	-0.668	0.798	-.893	0.703	0.240	0.260	0.37E+00	-.22E-01	MIS22d
27	0.6610	0.661	0.814	0.859	0.727	0.270	0.250	0.37E+00	0.12E+00	ATE08d
28	0.6450	0.645	0.717	0.876	0.757	0.260	0.240	0.45E+00	0.82E-01	PMD08d
29	0.6420	0.642	0.760	0.848	0.754	0.320	0.260	0.43E+00	0.25E+00	ME082d
30	0.6340	0.634	0.778	0.869	0.685	0.330	0.260	0.41E+00	0.16E+00	AF142d
31	0.6130	0.613	0.742	0.845	0.709	0.330	0.260	0.46E+00	0.26E+00	MA021d
32	-0.6020	-0.602	0.795	-.862	0.614	0.240	0.250	0.43E+00	-.67E-01	AS040d
33	0.6020	0.602	0.669	0.859	0.735	0.350	0.250	0.54E+00	0.23E+00	M4B08d
34	0.5680	0.568	0.686	0.842	0.664	0.350	0.260	0.51E+00	0.24E+00	M2B08d
35	0.5670	0.567	0.689	0.858	0.633	0.310	0.250	0.60E+00	0.75E-01	M3B08d
36	0.5590	0.559	0.737	0.791	0.677	0.300	0.260	0.54E+00	0.15E+00	MB011d
37	-0.5450	-0.545	0.785	-.775	0.630	0.160	0.250	0.64E+00	-.48E+00	AS031d
38	**0.5340**	**0.534**	**0.704**	**0.759**	**0.000**	**0.440**	**0.210**	**0.68E+00**	**0.63E+00**	**M5B08d**
39	0.4840	0.484	0.607	0.798	0.000	0.370	0.230	0.54E+00	0.41E+00	MEB08d
40	-0.4620	-0.462	0.539	-.830	0.576	0.230	0.260	0.99E+00	-.40E+00	M4D08d
41	-0.4400	-0.440	0.551	-.840	0.499	0.210	0.240	0.84E+00	-.31E+00	MED08d
42	**-0.3140**	**-0.314**	**0.477**	**-.658**	**0.000**	**0.050**	**0.190**	**0.13E+01**	**-.12E+01**	**M6D08d**
	SH2047_Aust									
1	0.6400	0.640	0.746	0.807	0.843	0.093	0.043	0.80E+00	0.75E+00	AO202d
2	**0.6310**	**0.631**	**0.760**	**0.828**	**0.763**	**0.077**	**0.042**	**0.72E+00**	**0.58E+00**	**Mid08d**
3	0.6290	0.629	0.735	0.798	0.845	0.092	0.043	0.81E+00	0.76E+00	AO20qd
4	0.6150	0.615	0.661	0.824	0.844	0.096	0.044	0.84E+00	0.77E+00	A4O08d
5	0.6120	0.612	0.661	0.811	0.862	0.093	0.044	0.81E+00	0.75E+00	AO302d
6	0.6120	0.612	0.661	0.811	0.862	0.093	0.044	0.81E+00	0.75E+00	ATO08d
7	0.5800	0.580	0.746	0.781	0.740	0.091	0.042	0.80E+00	0.73E+00	MIS22d
8	0.5750	0.575	0.670	0.801	0.769	0.075	0.046	0.62E+00	0.47E+00	AS000d
9	0.5590	0.559	0.588	0.814	0.801	0.065	0.044	0.57E+00	0.34E+00	AF142d

10	0.5560	0.556	0.727	0.810	0.649	0.072	0.044	0.67E+00	0.42E+00	MOC6xd
11	0.5490	0.549	0.662	0.760	0.790	0.130	0.046	0.10E+01	0.10E+01	MB011d
12	0.5480	0.548	0.623	0.778	0.795	0.110	0.051	0.78E+00	0.71E+00	A7E08d
13	0.5480	0.548	0.705	0.738	0.781	0.110	0.045	0.85E+00	0.80E+00	AS042d
14	**0.5390**	**0.539**	**0.654**	**0.835**	**0.637**	**0.061**	**0.046**	**0.61E+00**	**0.25E+00**	**MO61xd**
15	0.5370	0.537	0.691	0.733	0.777	0.110	0.045	0.86E+00	0.80E+00	AS041d
16	0.5370	0.537	0.647	0.804	0.689	0.076	0.049	0.59E+00	0.34E+00	AVH08d
17	0.5340	0.534	0.703	0.760	0.000	0.071	0.042	0.64E+00	0.50E+00	AF23pd
18	0.5340	0.534	0.703	0.760	0.000	0.071	0.042	0.64E+00	0.50E+00	ATF08d
19	0.5300	0.530	0.684	0.745	0.738	0.130	0.044	0.98E+00	0.96E+00	MGR08d
20	**0.5230**	**0.523**	**0.650**	**0.727**	**0.795**	**0.074**	**0.042**	**0.66E+00**	**0.56E+00**	**AnF08d**
21	0.5220	0.522	0.657	0.752	0.734	0.095	0.050	0.72E+00	0.64E+00	ATE08d
22	0.5220	0.522	0.686	0.761	0.000	0.087	0.043	0.72E+00	0.53E+00	MA021d
23	**0.5180**	**0.518**	**0.666**	**0.737**	**0.741**	**0.110**	**0.046**	**0.87E+00**	**0.82E+00**	**AnS08d**
24	0.5100	0.510	0.627	0.736	0.764	0.110	0.045	0.86E+00	0.81E+00	AS040d
25	**0.5030**	**0.503**	**0.659**	**0.772**	**0.645**	**0.210**	**0.043**	**0.12E+01**	**0.78E+00**	**M6D08d**
26	0.4990	0.499	0.545	0.797	0.719	0.071	0.045	0.67E+00	0.42E+00	AS031d
27	0.4960	0.496	0.700	0.752	0.620	0.083	0.038	0.85E+00	0.62E+00	SW002d
28	0.4880	0.488	0.616	0.733	0.721	0.120	0.048	0.89E+00	0.82E+00	AS043d
29	0.4880	0.488	0.616	0.733	0.721	0.120	0.048	0.89E+00	0.82E+00	ATS08d
30	**0.4740**	**0.474**	**0.619**	**0.704**	**0.732**	**0.190**	**0.042**	**0.12E+01**	**0.12E+01**	**AnO08d**
31	0.4710	0.471	0.620	0.736	0.659	0.160	0.046	0.11E+01	0.10E+01	M4B08d
32	0.4700	0.470	0.637	0.758	0.604	0.490	0.049	0.16E+01	0.12E+01	M4D08d
33	0.4660	0.466	0.634	0.735	0.000	0.081	0.039	0.74E+00	0.60E+00	AQF08d
34	0.4570	0.457	0.615	0.828	0.494	0.076	0.046	0.71E+00	0.24E+00	MOC5Td
35	**0.4560**	**0.456**	**0.604**	**0.728**	**0.650**	**0.160**	**0.047**	**0.11E+01**	**0.98E+00**	**M5B08d**
36	0.4460	0.446	0.701	0.612	0.758	0.430	0.054	0.14E+01	0.14E+01	MED08d
37	0.4370	0.437	0.623	0.688	0.647	0.120	0.038	0.10E+01	0.92E+00	MEB08d
38	0.4170	0.417	0.642	0.655	0.633	0.200	0.045	0.10E+01	0.10E+01	ME082d
39	0.4120	0.412	0.589	0.675	0.632	0.160	0.045	0.11E+01	0.11E+01	M3B08d
40	0.4030	0.403	0.588	0.666	0.622	0.170	0.045	0.11E+01	0.11E+01	M2B08d
41	0.3450	0.345	0.520	0.664	0.000	0.100	0.039	0.95E+00	0.74E+00	PMD08d
	SH2047_Amer									
1	**0.7240**	**0.724**	**0.800**	**0.870**	**0.865**	**0.074**	**0.087**	**0.39E+00**	**-.88E-01**	**Mid08d**
2	0.7050	0.705	0.789	0.868	0.835	0.074	0.083	0.42E+00	-.95E-02	MIS22d
3	**-0.6440**	**-0.644**	**0.738**	**-.852**	**0.775**	**0.062**	**0.070**	**0.52E+00**	**-.16E+00**	**MO61xd**
4	0.6150	0.615	0.703	0.843	0.756	0.075	0.070	0.48E+00	0.19E+00	AO202d
5	0.6050	0.605	0.602	0.873	0.798	0.079	0.079	0.49E+00	0.89E-01	AS042d
6	0.6040	0.604	0.698	0.833	0.754	0.077	0.070	0.49E+00	0.22E+00	AO20qd
7	0.6010	0.601	0.707	0.839	0.726	0.080	0.076	0.61E+00	0.15E-01	SW002d
8	-0.5970	-0.597	0.756	-.840	0.668	0.061	0.072	0.60E+00	-.15E+00	MOC6xd
9	0.5960	0.596	0.694	0.845	0.717	0.097	0.073	0.58E+00	0.30E+00	AVH08d
10	0.5920	0.592	0.740	0.794	0.751	0.086	0.054	0.55E+00	0.40E+00	PO030d
11	0.5900	0.590	0.682	0.844	0.715	0.079	0.080	0.54E+00	0.16E+00	A4O08d
12	0.5880	0.588	0.595	0.864	0.778	0.076	0.077	0.52E+00	0.85E-01	AS041d
13	0.5850	0.585	0.584	0.882	0.753	0.081	0.082	0.52E+00	0.63E-01	AS040d
14	0.5670	0.567	0.669	0.815	0.724	0.081	0.069	0.56E+00	0.26E+00	AO302d
15	0.5670	0.567	0.669	0.815	0.724	0.081	0.069	0.56E+00	0.26E+00	ATO08d
16	0.5640	0.564	0.659	0.792	0.770	0.160	0.087	0.66E+00	0.48E+00	AS043d
17	0.5640	0.564	0.659	0.792	0.770	0.160	0.087	0.66E+00	0.48E+00	ATS08d
18	**0.5590**	**0.559**	**0.703**	**0.753**	**0.784**	**0.180**	**0.082**	**0.83E+00**	**0.75E+00**	**AnO08d**
19	0.5550	0.555	0.582	0.829	0.768	0.095	0.080	0.54E+00	0.27E+00	A7E08d
20	0.5470	0.547	0.568	0.835	0.758	0.084	0.077	0.54E+00	0.20E+00	ATE08d
21	0.5340	0.534	0.696	0.724	0.782	0.190	0.089	0.75E+00	0.72E+00	ME082d
22	**0.5240**	**0.524**	**0.631**	**0.757**	**0.760**	**0.160**	**0.086**	**0.71E+00**	**0.56E+00**	**AnS08d**
23	0.5110	0.511	0.708	0.706	0.741	0.190	0.067	0.92E+00	0.87E+00	MGR08d
24	0.5020	0.502	0.556	0.840	0.644	0.077	0.069	0.58E+00	0.20E+00	M3B08d
25	**0.4980**	**0.498**	**0.631**	**0.802**	**0.611**	**0.160**	**0.062**	**0.98E+00**	**0.43E+00**	**M6D08d**
26	0.4980	0.498	0.752	0.815	0.497	0.110	0.073	0.84E+00	0.29E+00	MOC5Td
27	0.4890	0.489	0.558	0.810	0.654	0.100	0.083	0.67E+00	0.25E+00	AF23pd
28	0.4890	0.489	0.558	0.810	0.654	0.100	0.083	0.67E+00	0.25E+00	ATF08d
29	-0.4870	-0.487	0.506	-.861	0.632	0.073	0.078	0.72E+00	-.11E+00	AS031d
30	**0.4840**	**0.484**	**0.559**	**0.790**	**0.670**	**0.110**	**0.082**	**0.67E+00**	**0.34E+00**	**AnF08d**
31	0.4790	0.479	0.552	0.825	0.612	0.083	0.071	0.62E+00	0.23E+00	M2B08d
32	0.4760	0.476	0.539	0.811	0.640	0.092	0.080	0.63E+00	0.20E+00	AF142d
33	0.4700	0.470	0.536	0.812	0.627	0.110	0.085	0.70E+00	0.23E+00	AQF08d
34	0.4690	0.469	0.689	0.745	0.577	0.150	0.073	0.84E+00	0.59E+00	M4B08d

35	0.4680	0.468	0.591	0.796	0.586	0.072	0.077	0.69E+00	0.23E-01	AS000d
36	**0.4680**	**0.468**	**0.713**	**0.743**	**0.556**	**0.140**	**0.076**	**0.79E+00**	**0.57E+00**	**M5B08d**
37	0.4660	0.466	0.729	0.769	0.504	0.130	0.072	0.75E+00	0.50E+00	MEB08d
38	0.4560	0.456	0.627	0.716	0.648	0.160	0.069	0.87E+00	0.80E+00	MB011d
39	0.4510	0.451	0.554	0.770	0.620	0.140	0.084	0.75E+00	0.43E+00	PMD08d
40	0.3900	0.390	0.457	0.712	0.655	0.180	0.061	0.12E+01	0.74E+00	MED08d
41	0.3890	0.389	0.570	0.756	0.464	0.270	0.068	0.13E+01	0.34E+00	M4D08d
	SH2047_Afri									
1	**0.7410**	**0.741**	**0.837**	**0.921**	**0.775**	**0.076**	**0.081**	**0.40E+00**	**0.23E-01**	**Mid08d**
2	0.7340	0.734	0.717	0.915	0.897	0.055	0.049	0.41E+00	0.18E+00	AO202d
3	0.7320	0.732	0.717	0.912	0.898	0.056	0.049	0.42E+00	0.19E+00	AO20qd
4	0.6940	0.694	0.797	0.830	0.877	0.099	0.096	0.56E+00	0.35E+00	A7E08d
5	0.6690	0.669	0.826	0.834	0.779	0.099	0.083	0.49E+00	0.24E+00	MIS22d
6	0.6640	0.664	0.799	0.816	0.829	0.081	0.063	0.55E+00	0.35E+00	ATE08d
7	0.6570	0.657	0.757	0.814	0.861	0.140	0.100	0.63E+00	0.50E+00	MGR08d
8	0.6470	0.647	0.789	0.849	0.737	0.110	0.094	0.53E+00	0.23E+00	MEB08d
9	0.6450	0.645	0.661	0.893	0.788	0.073	0.074	0.48E+00	-.34E-01	SW002d
10	0.6280	0.628	0.748	0.808	0.806	0.130	0.088	0.57E+00	0.39E+00	M5B08d
11	0.6220	0.622	0.743	0.863	0.700	0.180	0.230	0.55E+00	-.15E-01	Gpo08d
12	**0.6160**	**0.616**	**0.773**	**0.804**	**0.757**	**0.100**	**0.084**	**0.59E+00**	**0.35E+00**	**MO61xd**
13	0.6130	0.613	0.660	0.846	0.796	0.074	0.052	0.62E+00	0.32E+00	AO302d
14	0.6130	0.613	0.660	0.846	0.796	0.074	0.052	0.62E+00	0.32E+00	ATO08d
15	0.6100	0.610	0.775	0.773	0.803	0.150	0.100	0.64E+00	0.54E+00	ME082d
16	0.6070	0.607	0.758	0.790	0.778	0.110	0.098	0.61E+00	0.35E+00	MOC6xd
17	0.5980	0.598	0.749	0.801	0.745	0.110	0.087	0.64E+00	0.33E+00	MOC5Td
18	0.5850	0.585	0.747	0.770	0.771	0.096	0.056	0.59E+00	0.49E+00	MA021d
19	0.5710	0.571	0.684	0.803	0.739	0.110	0.086	0.65E+00	0.39E+00	M3B08d
20	0.5700	0.570	0.674	0.782	0.786	0.086	0.056	0.63E+00	0.46E+00	AF142d
21	0.5690	0.569	0.650	0.875	0.000	0.069	0.054	0.46E+00	0.26E+00	AS043d
22	0.5690	0.569	0.650	0.875	0.000	0.069	0.054	0.46E+00	0.26E+00	ATS08d
23	0.5590	0.559	0.672	0.833	0.000	0.068	0.052	0.53E+00	0.32E+00	AQF08d
24	0.5530	0.553	0.667	0.822	0.680	0.090	0.074	0.64E+00	0.22E+00	AVH08d
25	**0.5430**	**0.543**	**0.644**	**0.839**	**0.651**	**0.077**	**0.053**	**0.49E+00**	**0.31E+00**	**AnS08d**
26	0.5390	0.539	0.697	0.758	0.725	0.120	0.071	0.69E+00	0.54E+00	M4B08d
27	0.5360	0.536	0.595	0.768	0.820	0.140	0.095	0.77E+00	0.63E+00	MB011d
28	0.5330	0.533	0.660	0.754	0.757	0.091	0.056	0.69E+00	0.51E+00	AF23pd
29	0.5330	0.533	0.660	0.754	0.757	0.091	0.056	0.69E+00	0.51E+00	ATF08d
30	0.5300	0.530	0.623	0.774	0.753	0.100	0.064	0.60E+00	0.47E+00	PMD08d
31	0.5230	0.523	0.702	0.735	0.721	0.099	0.062	0.62E+00	0.49E+00	PO030d
32	0.5210	0.521	0.659	0.743	0.747	0.110	0.093	0.71E+00	0.44E+00	A4O08d
33	**0.5170**	**0.517**	**0.658**	**0.787**	**0.000**	**0.091**	**0.059**	**0.67E+00**	**0.44E+00**	**AnF08d**
34	0.5090	0.509	0.709	0.718	0.000	0.094	0.049	0.69E+00	0.66E+00	AS000d
35	0.4940	0.494	0.686	0.706	0.713	0.180	0.087	0.93E+00	0.73E+00	M2B08d
36	**-0.4930**	**-0.493**	**0.643**	**-.798**	**0.593**	**0.028**	**0.071**	**0.12E+01**	**-.92E+00**	**M6D08d**
37	-0.4910	-0.491	0.576	-.853	0.000	0.042	0.057	0.72E+00	-.28E+00	AS031d
38	0.4880	0.488	0.572	0.852	0.000	0.068	0.053	0.53E+00	0.33E+00	AS042d
39	0.4190	0.419	0.529	0.791	0.000	0.079	0.055	0.70E+00	0.43E+00	AS040d
40	**0.4160**	**0.416**	**0.544**	**0.764**	**0.000**	**0.088**	**0.049**	**0.71E+00**	**0.51E+00**	**AnO08d**
41	0.3880	0.388	0.496	0.781	0.000	0.081	0.051	0.68E+00	0.48E+00	AS041d
42	0.2900	0.290	0.358	0.811	0.000	0.330	0.140	0.12E+01	0.41E+00	M4D08d
	SH6047_ocea									
1	0.5190	0.519	0.719	0.721	0.000	0.049	0.026	0.75E+00	0.60E+00	M3B08d
2	0.5130	0.513	0.646	0.794	0.000	0.051	0.029	0.78E+00	0.35E+00	MOC6xd
3	0.5080	0.508	0.708	0.718	0.000	0.077	0.027	0.83E+00	0.79E+00	M2B08d
4	0.4780	0.478	0.705	0.678	0.000	0.057	0.020	0.94E+00	0.94E+00	MIS22d
5	**0.4690**	**0.469**	**0.586**	**0.723**	**0.719**	**0.056**	**0.029**	**0.65E+00**	**0.57E+00**	**MO61xd**
6	0.4340	0.434	0.686	0.633	0.000	0.074	0.023	0.11E+01	0.11E+01	A4O08d
7	0.4200	0.420	0.604	0.692	0.609	0.082	0.031	0.90E+00	0.79E+00	MOC5Td
8	0.4190	0.419	0.549	0.764	0.000	0.049	0.029	0.74E+00	0.47E+00	SW002d
9	0.4040	0.404	0.534	0.652	0.720	0.069	0.034	0.80E+00	0.69E+00	AVH08d
10	**0.3870**	**0.387**	**0.592**	**0.654**	**0.000**	**0.045**	**0.020**	**0.74E+00**	**0.71E+00**	**Mid08d**
11	**0.3720**	**0.372**	**0.573**	**0.649**	**0.000**	**0.130**	**0.023**	**0.13E+01**	**0.12E+01**	**AnO08d**
12	0.3540	0.354	0.502	0.705	0.000	0.340	0.026	0.16E+01	0.11E+01	M4D08d
13	0.3530	0.353	0.611	0.578	0.000	0.160	0.028	0.13E+01	0.13E+01	MGR08d
14	0.2690	0.269	0.599	0.572	0.370	0.140	0.022	0.14E+01	0.14E+01	MB011d
15	0.2590	0.259	0.446	0.581	0.000	0.060	0.021	0.93E+00	0.93E+00	AF142d
16	0.2420	0.242	0.415	0.583	0.000	0.098	0.023	0.11E+01	0.10E+01	PMD08d

17	0.2360	0.236	0.457	0.516	0.000	0.260	0.020	0.16E+01	0.16E+01	ME082d
18	0.2240	0.224	0.435	0.516	0.000	0.150	0.020	0.15E+01	0.15E+01	M4B08d
19	**0.2100**	**0.210**	**0.390**	**0.538**	**0.000**	**0.067**	**0.021**	**0.10E+01**	**0.10E+01**	**AnF08d**
20	0.1220	0.122	0.226	0.538	0.000	0.160	0.019	0.14E+01	0.14E+01	MEB08d
21	0.1180	0.118	0.223	0.531	0.000	0.160	0.018	0.15E+01	0.14E+01	M5B08d

The Figures 9.2 and 9.3 below compare the regional combination scores of most recent AOD retrievals and of the three ATSR current AOD retrievals to those of older versions. Note, that without sufficient retrieval data or matches to references no scores could be provided. In addition in Figure 9.4 regional errors (associated with the AOD retrieval sub-scores) for the most recent ATSR retrievals are compared. Hereby, stronger colors mean a larger error. For the bias sub-score a blue color indicates a regional AOD underestimate and a red color indicates a regional AOD overestimate.

AOD - regional scores *(green better - red worse)*

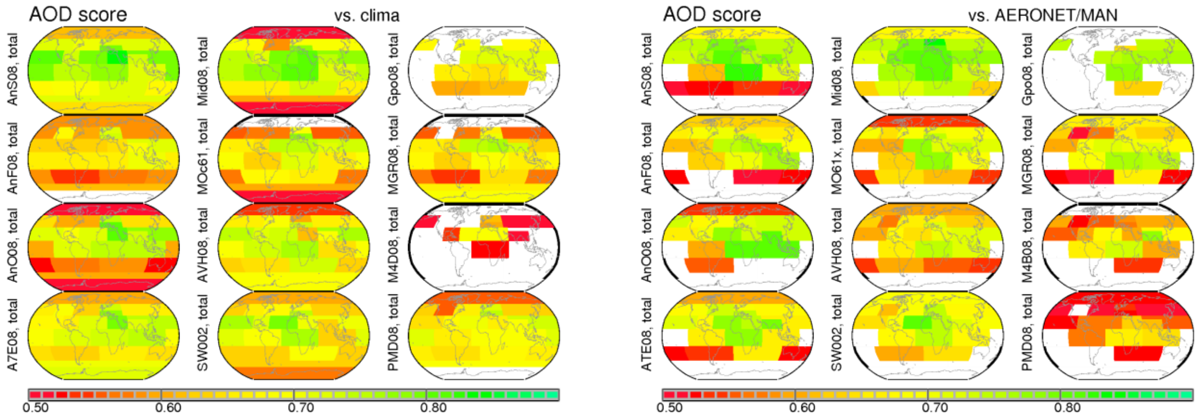

Figure 9.2 *regional AOD scores for most recent retrievals of ATSR (left colum), of NASA retrievals (center column) and of MERIS (and –like) retrievals (right column) against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AOD - regional ATSR scores *(green better - red worse)*

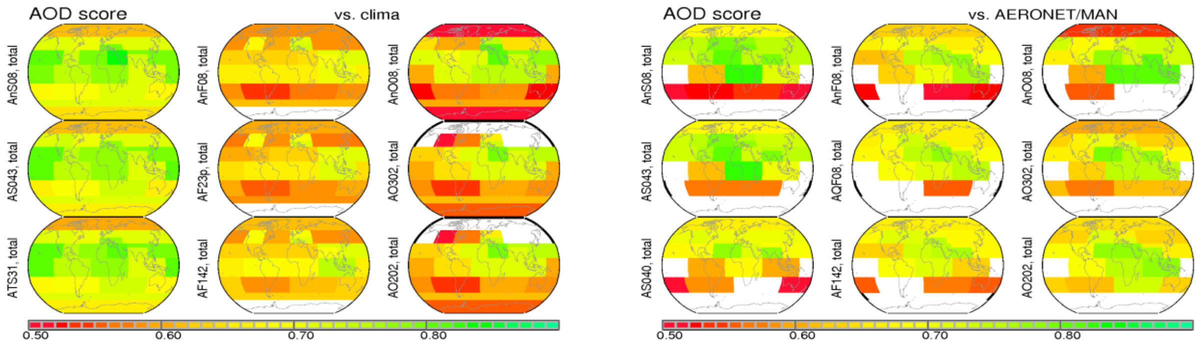

Figure 9.3 *regional AOD scores for most recent retrievals of ATSR SU /FI /OX (top row) to older versions (lower rows colum) against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AOD - regional ATSR error/bias *(blue negative - red positive)*

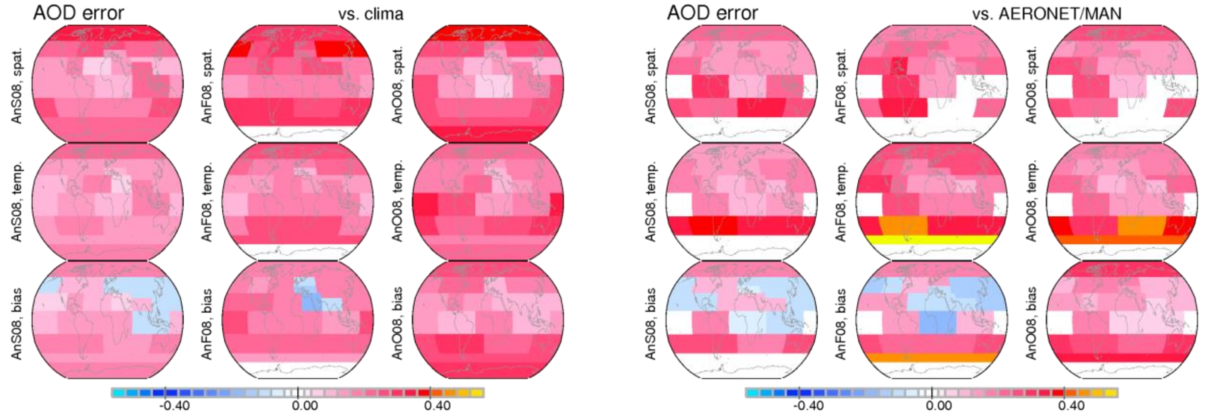

Figure 9.4 *regional AOD errors (in red) for spatial correlation (top row) temporal correlation (center row) and bias (bottom row, blue indicates a negative sign) for the most recent retrievals of ATSR SU /FI /OX against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AOD (AOD > 0.2) scoring

AOD *(AOD>0.2) – ranking* ***global*** *scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	**0.7870**	**0.787**	**0.854**	**0.922**	**0.841**	**0.300**	**0.300**	**0.26E+00**	**-.57E-01**	**Mid08m**
2	0.7820	0.782	0.869	0.901	0.872	0.340	0.290	0.27E+00	0.98E-01	Pol30m
3	**0.7800**	**0.780**	**0.865**	**0.901**	**0.843**	**0.350**	**0.300**	**0.27E+00**	**0.10E+00**	**AnO08m**
4	0.7800	0.780	0.856	0.911	0.820	0.310	0.300	0.26E+00	0.87E-02	Mis08m
5	0.7760	0.776	0.859	0.903	0.804	0.350	0.300	0.28E+00	0.12E+00	M2B08m
6	0.7760	0.776	0.861	0.901	0.837	0.340	0.300	0.29E+00	0.10E+00	MO508m
7	**0.7750**	**0.775**	**0.864**	**0.896**	**0.836**	**0.340**	**0.300**	**0.28E+00**	**0.83E-01**	**MOc61m**
8	**0.7740**	**0.774**	**0.858**	**0.903**	**0.846**	**0.300**	**0.300**	**0.28E+00**	**-.46E-01**	**AnS08m**
9	0.7740	0.774	0.854	0.907	0.838	0.310	0.300	0.28E+00	-.22E-01	MO608m
10	-0.7730	-0.773	0.853	-.906	0.839	0.290	0.300	0.28E+00	-.95E-01	ATE08m
11	0.7730	0.773	0.845	0.914	0.799	0.330	0.300	0.29E+00	0.56E-01	M3B08m
12	0.7710	0.771	0.847	0.911	0.838	0.320	0.300	0.28E+00	-.14E-01	A7E08m
13	0.7680	0.768	0.855	0.898	0.844	0.300	0.300	0.29E+00	-.60E-01	ATS31m
14	-0.7660	-0.766	0.850	-.901	0.804	0.300	0.300	0.30E+00	-.47E-01	AO202m
15	-0.7660	-0.766	0.850	-.901	0.804	0.300	0.300	0.30E+00	-.47E-01	AO302m
16	0.7630	0.763	0.853	0.895	0.841	0.300	0.300	0.30E+00	-.50E-01	AS043m
17	0.7630	0.763	0.853	0.895	0.841	0.300	0.300	0.30E+00	-.50E-01	ATS30m
18	0.7610	0.761	0.842	0.904	0.811	0.320	0.300	0.30E+00	0.40E-01	MGR08m
19	-0.7600	-0.760	0.854	-.890	0.838	0.280	0.300	0.32E+00	-.12E+00	AS042m
20	**-0.7540**	**-0.754**	**0.841**	**-.897**	**0.778**	**0.290**	**0.300**	**0.32E+00**	**-.61E-01**	**M4B08m**
21	0.7540	0.754	0.835	0.903	0.784	0.300	0.310	0.29E+00	-.29E-01	PMD08m
22	-0.7460	-0.746	0.835	-.894	0.809	0.260	0.300	0.37E+00	-.19E+00	AQF08m
23	**-0.7420**	**-0.742**	**0.833**	**-.890**	**0.792**	**0.290**	**0.300**	**0.37E+00**	**-.12E+00**	**AnF08m**
24	0.7410	0.741	0.842	0.881	0.808	0.330	0.300	0.33E+00	0.32E-01	A4O08m
25	-0.7410	-0.741	0.839	-.884	0.789	0.260	0.300	0.39E+00	-.19E+00	AF142m
26	-0.7390	-0.739	0.834	-.886	0.789	0.280	0.300	0.38E+00	-.13E+00	AF23pm
27	-0.7370	-0.737	0.825	-.894	0.800	0.280	0.300	0.34E+00	-.13E+00	AVH08m
28	0.7360	0.736	0.869	0.847	0.845	0.440	0.320	0.38E+00	0.27E+00	Gpo08m
29	-0.7350	-0.735	0.823	-.893	0.783	0.270	0.310	0.35E+00	-.17E+00	Sea08m
30	-0.7350	-0.735	0.823	-.893	0.783	0.270	0.310	0.35E+00	-.17E+00	SW002m
31	-0.7090	-0.709	0.829	-.854	0.745	0.310	0.300	0.41E+00	-.26E-01	M1B08m
32	0.6670	0.667	0.767	0.869	0.704	0.270	0.300	0.45E+00	-.17E+00	M4D08m

***AOD** (AOD>0.2) – ranking **oceanic** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.7980	0.798	0.853	0.936	0.873	0.300	0.280	0.23E+00	0.25E-01	A7E08m
2	**0.7940**	**0.794**	**0.851**	**0.933**	**0.860**	**0.280**	**0.290**	**0.22E+00**	**-.41E-01**	**Mid08m**
3	0.7940	0.794	0.846	0.938	0.872	0.280	0.280	0.23E+00	-.15E-01	MOC6xm
4	**0.7920**	**0.792**	**0.859**	**0.922**	**0.865**	**0.310**	**0.280**	**0.24E+00**	**0.10E+00**	**MO61xm**
5	0.7860	0.786	0.845	0.930	0.867	0.290	0.280	0.24E+00	0.55E-01	MOC5Tm
6	0.7840	0.784	0.848	0.924	0.840	0.300	0.280	0.24E+00	0.41E-01	MIS08m
7	0.7800	0.780	0.844	0.924	0.870	0.290	0.280	0.24E+00	-.24E-01	ATE08m
8	0.7780	0.778	0.836	0.931	0.844	0.300	0.280	0.25E+00	0.39E-01	AO202m
9	0.7780	0.778	0.836	0.931	0.844	0.300	0.280	0.25E+00	0.39E-01	AO302m
10	0.7710	0.771	0.827	0.932	0.851	0.290	0.280	0.25E+00	0.18E-01	MGR08m
11	-0.7700	-0.770	0.830	-.928	0.837	0.280	0.290	0.26E+00	-.36E-01	PMD08m
12	0.7700	0.770	0.836	0.921	0.883	0.310	0.270	0.23E+00	0.12E+00	PO030m
13	-0.7670	-0.767	0.840	-.914	0.839	0.250	0.280	0.28E+00	-.12E+00	AQF08m
14	**0.7660**	**0.766**	**0.843**	**0.908**	**0.862**	**0.330**	**0.280**	**0.25E+00**	**0.14E+00**	**AnO08m**
15	0.7650	0.765	0.844	0.907	0.815	0.320	0.280	0.27E+00	0.11E+00	M2B08m
16	-0.7630	-0.763	0.853	-.894	0.844	0.280	0.290	0.27E+00	-.80E-01	AS042m
17	**0.7620**	**0.762**	**0.831**	**0.917**	**0.814**	**0.270**	**0.280**	**0.28E+00**	**-.28E-01**	**AnF08m**
18	**-0.7620**	**-0.762**	**0.840**	**-.907**	**0.863**	**0.280**	**0.290**	**0.25E+00**	**-.65E-01**	**AnS08m**
19	0.7560	0.756	0.837	0.903	0.817	0.260	0.280	0.30E+00	-.81E-01	AF142m
20	-0.7560	-0.756	0.819	-.922	0.805	0.300	0.280	0.27E+00	0.31E-01	M3B08m
21	-0.7550	-0.755	0.838	-.901	0.865	0.280	0.280	0.26E+00	-.64E-01	AS031m
22	-0.7550	-0.755	0.825	-.915	0.829	0.280	0.280	0.29E+00	-.78E-01	AVH08m
23	0.7540	0.754	0.832	0.907	0.816	0.280	0.280	0.30E+00	-.39E-01	AF23pm
24	-0.7530	-0.753	0.822	-.917	0.843	0.280	0.320	0.29E+00	-.12E+00	SW002m
25	-0.7510	-0.751	0.837	-.898	0.862	0.290	0.280	0.27E+00	-.55E-01	AS043m
26	0.7480	0.748	0.843	0.887	0.840	0.330	0.290	0.28E+00	0.13E+00	A4O08m
27	-0.7440	-0.744	0.863	-.863	0.892	0.370	0.320	0.29E+00	0.15E+00	Gpo08m
28	**-0.7440**	**-0.744**	**0.832**	**-.895**	**0.781**	**0.270**	**0.280**	**0.32E+00**	**-.49E-01**	**M4B08m**
29	-0.7210	-0.721	0.859	-.840	0.729	0.290	0.280	0.44E+00	-.25E-01	MB011m
30	-0.6810	-0.681	0.774	-.880	0.722	0.260	0.290	0.38E+00	-.16E+00	M4D08m

***AOD** (AOD>0.2) – ranking **continental** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.8310	0.831	0.891	0.933	0.898	0.280	0.290	0.23E+00	-.92E-01	SEV08m
2	**0.7850**	**0.785**	**0.874**	**0.898**	**0.835**	**0.360**	**0.310**	**0.27E+00**	**0.86E-01**	**AnO08m**
3	0.7850	0.785	0.879	0.892	0.866	0.350	0.300	0.28E+00	0.88E-01	PO030m
4	**0.7840**	**0.784**	**0.855**	**0.917**	**0.832**	**0.300**	**0.310**	**0.28E+00**	**-.65E-01**	**Mid08m**
5	0.7810	0.781	0.866	0.902	0.799	0.360	0.310	0.29E+00	0.12E+00	M2B08m
6	**0.7800**	**0.780**	**0.865**	**0.901**	**0.839**	**0.310**	**0.310**	**0.30E+00**	**-.37E-01**	**AnS08m**
7	0.7800	0.780	0.856	0.911	0.796	0.340	0.310	0.30E+00	0.68E-01	M3B08m
8	0.7780	0.778	0.860	0.905	0.811	0.320	0.310	0.28E+00	-.63E-02	MIS08m
9	0.7730	0.773	0.862	0.897	0.834	0.310	0.310	0.30E+00	-.59E-01	AS031m
10	0.7720	0.772	0.868	0.889	0.823	0.370	0.310	0.31E+00	0.12E+00	MOC5Tm
11	-0.7700	-0.770	0.857	-.899	0.824	0.290	0.310	0.31E+00	-.13E+00	ATE08m
12	0.7680	0.768	0.859	0.894	0.831	0.310	0.310	0.31E+00	-.48E-01	AS043m
13	**0.7670**	**0.767**	**0.867**	**0.885**	**0.822**	**0.350**	**0.310**	**0.30E+00**	**0.73E-01**	**MO61xm**
14	0.7660	0.766	0.857	0.894	0.822	0.320	0.310	0.30E+00	-.26E-01	MOC6xm
15	0.7600	0.760	0.844	0.900	0.822	0.320	0.310	0.30E+00	-.32E-01	A7E08m
16	-0.7600	-0.760	0.856	-.888	0.786	0.300	0.300	0.33E+00	-.86E-01	AO202m
17	-0.7600	-0.760	0.856	-.888	0.786	0.300	0.300	0.33E+00	-.86E-01	AO302m
18	0.7590	0.759	0.854	0.888	0.836	0.290	0.310	0.35E+00	-.14E+00	AS042m
19	**-0.7580**	**-0.758**	**0.845**	**-.898**	**0.776**	**0.300**	**0.310**	**0.32E+00**	**-.67E-01**	**M4B08m**
20	0.7560	0.756	0.848	0.892	0.793	0.340	0.310	0.32E+00	0.51E-01	MGR08m
21	0.7480	0.748	0.837	0.893	0.760	0.320	0.310	0.31E+00	-.25E-01	PMD08m
22	0.7390	0.739	0.841	0.879	0.793	0.330	0.310	0.35E+00	-.11E-01	A4O08m
23	-0.7380	-0.738	0.833	-.885	0.795	0.270	0.310	0.41E+00	-.23E+00	AQF08m
24	-0.7350	-0.735	0.840	-.876	0.776	0.270	0.310	0.43E+00	-.24E+00	AF142m
25	-0.7330	-0.733	0.835	-.877	0.776	0.290	0.310	0.42E+00	-.17E+00	AF23pm
26	**-0.7330**	**-0.733**	**0.834**	**-.879**	**0.781**	**0.290**	**0.310**	**0.41E+00**	**-.16E+00**	**AnF08m**
27	0.7330	0.733	0.871	0.842	0.829	0.470	0.320	0.42E+00	0.31E+00	Gpo08m
28	-0.7300	-0.730	0.824	-.885	0.787	0.280	0.310	0.37E+00	-.16E+00	AVH08m
29	-0.7290	-0.729	0.824	-.885	0.764	0.270	0.310	0.37E+00	-.19E+00	SW002m

30	-0.7030	-0.703	0.817	-.860	0.753	0.320	0.310	0.39E+00	-.26E-01	MB011m
31	0.6610	0.661	0.764	0.864	0.696	0.270	0.310	0.49E+00	-.17E+00	M4D08m

***AOD** (AOD >0.2) – ranking **global** scores based on matches of daily 1x1 deg avgs with AERONET*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	**-0.7710**	**-0.771**	**0.854**	**-.902**	**0.000**	**0.400**	**0.390**	**0.30E+00**	**-.63E-02**	**AnO08d**
2	0.7560	0.756	0.827	0.914	0.847	0.370	0.330	0.27E+00	0.52E-01	PO030d
3	**-0.7500**	**-0.750**	**0.844**	**-.889**	**0.000**	**0.350**	**0.410**	**0.31E+00**	**-.18E+00**	**Mid08d**
4	**-0.7480**	**-0.748**	**0.830**	**-.901**	**0.000**	**0.380**	**0.380**	**0.32E+00**	**-.76E-01**	**AnS08d**
5	-0.7430	-0.743	0.827	-.899	0.000	0.370	0.380	0.32E+00	-.89E-01	AS043d
6	-0.7400	-0.740	0.828	-.894	0.831	0.360	0.400	0.36E+00	-.16E+00	MOC6xd
7	-0.7340	-0.734	0.828	-.886	0.822	0.340	0.380	0.34E+00	-.17E+00	ATE08d
8	-0.7330	-0.733	0.833	-.880	0.000	0.340	0.370	0.40E+00	-.17E+00	A4O08d
9	-0.7220	-0.722	0.820	-.881	0.000	0.340	0.380	0.34E+00	-.17E+00	AS042d
10	-0.7190	-0.719	0.827	-.869	0.000	0.320	0.390	0.40E+00	-.27E+00	AQF08d
11	-0.7170	-0.717	0.811	-.883	0.000	0.350	0.390	0.34E+00	-.16E+00	AS041d
12	-0.7160	-0.716	0.824	-.869	0.826	0.320	0.390	0.42E+00	-.26E+00	AF142d
13	-0.7130	-0.713	0.808	-.882	0.804	0.340	0.390	0.36E+00	-.17E+00	AS040d
14	0.7120	0.712	0.791	0.900	0.821	0.340	0.330	0.34E+00	-.50E-01	MA021d
15	**-0.7100**	**-0.710**	**0.806**	**-.881**	**0.790**	**0.370**	**0.400**	**0.40E+00**	**-.15E+00**	**MO61xd**
16	-0.7070	-0.707	0.798	-.887	0.816	0.380	0.400	0.38E+00	-.94E-01	MOC5Td
17	-0.7010	-0.701	0.785	-.894	0.820	0.350	0.380	0.36E+00	-.14E+00	A7E08d
18	-0.7000	-0.700	0.793	-.882	0.816	0.420	0.400	0.35E+00	0.49E-01	ME082d
19	-0.6970	-0.697	0.799	-.872	0.000	0.340	0.400	0.35E+00	-.18E+00	MIS22d
20	**-0.6960**	**-0.696**	**0.804**	**-.865**	**0.000**	**0.310**	**0.380**	**0.42E+00**	**-.26E+00**	**AnF08d**
21	-0.6930	-0.693	0.779	-.889	0.825	0.370	0.360	0.36E+00	0.29E-02	MGR08d
22	-0.6890	-0.689	0.797	-.865	0.817	0.310	0.370	0.44E+00	-.27E+00	SW002d
23	-0.6880	-0.688	0.801	-.859	0.000	0.320	0.390	0.43E+00	-.29E+00	AF23pd
24	-0.6880	-0.688	0.801	-.860	0.000	0.310	0.370	0.41E+00	-.22E+00	AO202d
25	-0.6880	-0.688	0.789	-.872	0.813	0.320	0.350	0.42E+00	-.18E+00	AO302d
26	-0.6870	-0.687	0.795	-.864	0.793	0.340	0.400	0.45E+00	-.26E+00	AVH08d
27	**-0.6780**	**-0.678**	**0.768**	**-.883**	**0.786**	**0.330**	**0.380**	**0.43E+00**	**-.18E+00**	**M4B08d**
28	-0.6550	-0.655	0.752	-.870	0.776	0.340	0.380	0.44E+00	-.16E+00	M2B08d
29	-0.6540	-0.654	0.752	-.870	0.775	0.340	0.390	0.47E+00	-.20E+00	M3B08d
30	-0.6340	-0.634	0.775	-.818	0.000	0.260	0.370	0.55E+00	-.44E+00	AS031d
31	-0.6060	-0.606	0.724	-.837	0.762	0.360	0.380	0.50E+00	-.12E+00	MB011d
32	-0.5830	-0.583	0.692	-.843	0.000	0.300	0.390	0.59E+00	-.34E+00	PMD08d
33	**-0.5350**	**-0.535**	**0.694**	**-.770**	**0.000**	**0.230**	**0.410**	**0.91E+00**	**-.75E+00**	**M6D08d**
34	-0.5220	-0.522	0.637	-.819	0.655	0.290	0.400	0.86E+00	-.55E+00	M4D08d

***all AOD > 0.2** – ranking **regional** scores based on matches of daily 1x1 deg avg with AERONET/MAN*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
	Arctic									
1	0.8880	0.888	0.967	0.918	0.000	0.350	0.300	0.19E+00	0.15E+00	A4O08d
2	-0.8560	-0.856	0.882	-.971	0.000	0.280	0.290	0.17E+00	-.39E-01	A7E08d
3	**-0.8340**	**-0.834**	**0.915**	**-.911**	**0.000**	**0.260**	**0.300**	**0.20E+00**	**-.16E+00**	**AnF08d**
4	-0.8200	-0.820	0.868	-.945	0.000	0.280	0.290	0.17E+00	-.63E-01	AS040d
5	-0.8100	-0.810	0.901	-.899	0.000	0.250	0.300	0.22E+00	-.19E+00	AF23pd
6	-0.8040	-0.804	0.883	-.910	0.000	0.250	0.300	0.23E+00	-.19E+00	AF142d
7	0.7980	0.798	0.871	0.916	0.000	0.300	0.280	0.26E+00	0.22E-01	M5B08d
8	-0.7930	-0.793	0.860	-.923	0.000	0.280	0.310	0.17E+00	-.10E+00	ATE08d
9	-0.7810	-0.781	0.818	-.955	0.000	0.310	0.310	0.29E+00	-.54E-01	MOC6xd
10	**0.7790**	**0.779**	**0.818**	**0.952**	**0.000**	**0.350**	**0.310**	**0.32E+00**	**0.27E-01**	**MO61xd**
11	**0.7700**	**0.770**	**0.816**	**0.943**	**0.000**	**0.300**	**0.300**	**0.20E+00**	**-.73E-02**	**AnS08d**
12	-0.7690	-0.769	0.809	-.950	0.000	0.290	0.300	0.40E+00	-.18E+00	SW002d
13	-0.7620	-0.762	0.863	-.884	0.000	0.250	0.300	0.23E+00	-.19E+00	AQF08d
14	-0.7620	-0.762	0.809	-.942	0.000	0.300	0.300	0.20E+00	-.21E-01	AS043d
15	**0.7600**	**0.760**	**0.818**	**0.930**	**0.000**	**0.360**	**0.330**	**0.28E+00**	**-.15E-01**	**Mid08d**
16	-0.7390	-0.739	0.803	-.920	0.000	0.370	0.340	0.29E+00	-.53E-01	MIS22d
17	0.7320	0.732	0.787	0.930	0.000	0.340	0.320	0.30E+00	-.24E-01	M3B08d
18	-0.7200	-0.720	0.790	-.912	0.000	0.280	0.290	0.19E+00	-.91E-01	AS041d
19	-0.7200	-0.720	0.789	-.913	0.000	0.280	0.290	0.19E+00	-.91E-01	AS042d

20	0.7100	0.710	0.824	0.862	0.000	0.680	0.380	0.48E+00	0.32E+00	ME082d
21	0.6990	0.699	0.777	0.888	0.798	0.420	0.340	0.38E+00	0.16E+00	MOC5Td
22	-0.6970	-0.697	0.817	-.853	0.000	0.260	0.330	0.51E+00	-.39E+00	AVH08d
23	0.6960	0.696	0.766	0.909	0.000	0.330	0.310	0.29E+00	0.21E-02	M2B08d
24	**-0.6780**	**-0.678**	**0.725**	**-.936**	**0.000**	**0.310**	**0.300**	**0.34E+00**	**-.11E+00**	**M4B08d**
25	-0.6300	-0.630	0.770	-.819	0.000	0.230	0.330	0.67E+00	-.56E+00	PMD08d
26	0.5880	0.588	0.702	0.837	0.000	0.620	0.320	0.58E+00	0.39E+00	MB011d
27	-0.5330	-0.533	0.613	-.870	0.000	0.280	0.320	0.74E+00	-.41E+00	M4D08d
	NH3760_Asia									
1	0.7500	0.750	0.860	0.889	0.828	0.740	0.750	0.35E+00	0.68E-01	Gpo08d
2	**-0.7120**	**-0.712**	**0.844**	**-.896**	**0.749**	**0.360**	**0.350**	**0.35E+00**	**-.53E-01**	**AnO08d**
3	-0.6990	-0.699	0.839	-.832	0.840	0.320	0.450	0.58E+00	-.48E+00	AF142d
4	-0.6970	-0.697	0.820	-.866	0.791	0.490	0.580	0.47E+00	-.25E+00	MOC6xd
5	**-0.6960**	**-0.696**	**0.810**	**-.843**	**0.842**	**0.350**	**0.530**	**0.42E+00**	**-.34E+00**	**Mid08d**
6	-0.6930	-0.693	0.783	-.882	0.789	0.520	0.550	0.40E+00	-.56E-01	MOC5Td
7	-0.6920	-0.692	0.784	-.872	0.803	0.340	0.400	0.41E+00	-.21E+00	AS040d
8	**-0.6880**	**-0.688**	**0.807**	**-.830**	**0.849**	**0.350**	**0.490**	**0.59E+00**	**-.48E+00**	**AnF08d**
9	-0.6810	-0.681	0.819	-.830	0.823	0.440	0.580	0.59E+00	-.47E+00	AF23pd
10	**-0.6790**	**-0.679**	**0.757**	**-.882**	**0.783**	**0.370**	**0.390**	**0.43E+00**	**-.15E+00**	**AnS08d**
11	-0.6770	-0.677	0.782	-.874	0.769	0.350	0.410	0.42E+00	-.20E+00	AS042d
12	**-0.6700**	**-0.670**	**0.759**	**-.871**	**0.780**	**0.480**	**0.560**	**0.50E+00**	**-.24E+00**	**MO61xd**
13	-0.6680	-0.668	0.759	-.857	0.800	0.360	0.510	0.43E+00	-.30E+00	MIS22d
14	-0.6650	-0.665	0.783	-.862	0.761	0.440	0.510	0.44E+00	-.25E+00	A7E08d
15	-0.6580	-0.658	0.844	-.835	0.737	0.320	0.440	0.53E+00	-.44E+00	AQF08d
16	-0.6560	-0.656	0.777	-.866	0.739	0.350	0.410	0.43E+00	-.20E+00	AS041d
17	-0.6550	-0.655	0.721	-.863	0.800	0.490	0.600	0.43E+00	-.39E-01	ME082d
18	-0.6540	-0.654	0.752	-.877	0.740	0.370	0.390	0.45E+00	-.14E+00	AS043d
19	-0.6480	-0.648	0.801	-.837	0.747	0.330	0.430	0.49E+00	-.35E+00	ATE08d
20	-0.6250	-0.625	0.703	-.870	0.734	0.400	0.460	0.46E+00	-.94E-01	M3B08d
21	**-0.6230**	**-0.623**	**0.721**	**-.810**	**0.820**	**0.310**	**0.460**	**0.77E+00**	**-.48E+00**	**M6D08d**
22	-0.6150	-0.615	0.700	-.870	0.714	0.410	0.460	0.47E+00	-.97E-01	M2B08d
23	-0.6130	-0.613	0.729	-.830	0.749	0.350	0.550	0.55E+00	-.37E+00	M5B08d
24	-0.6010	-0.601	0.665	-.854	0.744	0.430	0.410	0.48E+00	0.55E-01	MGR08d
25	-0.6000	-0.600	0.769	-.826	0.687	0.300	0.440	0.52E+00	-.37E+00	A4O08d
26	-0.5980	-0.598	0.709	-.827	0.737	0.420	0.510	0.64E+00	-.37E+00	AVH08d
27	**-0.5950**	**-0.595**	**0.751**	**-.834**	**0.678**	**0.300**	**0.430**	**0.57E+00**	**-.36E+00**	**M4B08d**
28	-0.5900	-0.590	0.693	-.812	0.762	0.270	0.400	0.61E+00	-.45E+00	AS031d
29	-0.5890	-0.589	0.751	-.819	0.689	0.340	0.430	0.62E+00	-.36E+00	SW002d
30	-0.5810	-0.581	0.742	-.790	0.730	0.240	0.340	0.59E+00	-.43E+00	AO302d
31	-0.5690	-0.569	0.685	-.832	0.682	0.410	0.460	0.55E+00	-.12E+00	MB011d
32	-0.5360	-0.536	0.727	-.737	0.000	0.210	0.410	0.63E+00	-.53E+00	AO202d
33	-0.5260	-0.526	0.618	-.819	0.667	0.330	0.470	0.83E+00	-.52E+00	M4D08d
34	-0.5250	-0.525	0.658	-.808	0.641	0.500	0.580	0.70E+00	-.27E+00	PMD08d
	NH3760_Amer									
1	0.7810	0.781	0.000	0.935	0.835	0.260	0.260	0.26E+00	-.93E-01	AF142d
2	**0.7810**	**0.781**	**0.765**	**0.951**	**0.881**	**0.260**	**0.260**	**0.26E+00**	**-.69E-01**	**AnS08d**
3	-0.7770	-0.777	0.790	-.931	0.880	0.240	0.250	0.29E+00	-.15E+00	AS041d
4	-0.7760	-0.776	0.756	-.943	0.895	0.240	0.250	0.29E+00	-.14E+00	AS043d
5	-0.7730	-0.773	0.790	-.931	0.873	0.230	0.250	0.29E+00	-.15E+00	AS042d
6	-0.7480	-0.748	0.779	-.928	0.834	0.240	0.270	0.35E+00	-.21E+00	AO302d
7	-0.7330	-0.733	0.766	-.916	0.836	0.260	0.280	0.29E+00	-.10E+00	AF23pd
8	-0.7320	-0.732	0.754	-.925	0.830	0.280	0.290	0.32E+00	-.54E-01	AS040d
9	0.7210	0.721	0.716	0.922	0.854	0.290	0.270	0.27E+00	0.59E-01	A4O08d
10	-0.7200	-0.720	0.742	-.899	0.866	0.230	0.260	0.32E+00	-.16E+00	A7E08d
11	-0.7140	-0.714	0.794	-.909	0.778	0.270	0.280	0.37E+00	-.98E-01	MOC6xd
12	**-0.7120**	**-0.712**	**0.743**	**-.909**	**0.826**	**0.270**	**0.280**	**0.31E+00**	**-.56E-01**	**AnF08d**
13	-0.7110	-0.711	0.769	-.893	0.824	0.230	0.270	0.32E+00	-.17E+00	ATE08d
14	-0.7050	-0.705	0.718	-.919	0.820	0.250	0.290	0.31E+00	-.17E+00	AQF08d
15	0.6890	0.689	0.773	0.890	0.774	0.330	0.280	0.41E+00	0.73E-01	MOC5Td
16	**-0.6820**	**-0.682**	**0.775**	**-.879**	**0.776**	**0.290**	**0.280**	**0.43E+00**	**-.63E-01**	**MO61xd**
17	-0.6800	-0.680	0.725	-.885	0.813	0.230	0.280	0.39E+00	-.25E+00	SW002d
18	-0.6790	-0.679	0.765	-.888	0.000	0.230	0.260	0.33E+00	-.22E+00	AO202d
19	-0.6790	-0.679	0.738	-.870	0.823	0.200	0.260	0.39E+00	-.30E+00	AS031d
20	**-0.6660**	**-0.666**	**0.736**	**-.880**	**0.779**	**0.270**	**0.270**	**0.49E+00**	**-.11E+00**	**M4B08d**
21	-0.6590	-0.659	0.756	-.864	0.770	0.280	0.280	0.49E+00	-.50E-01	M3B08d
22	0.6560	0.656	0.726	0.864	0.794	0.290	0.280	0.47E+00	-.16E-01	M2B08d
23	**0.6520**	**0.652**	**0.745**	**0.875**	**0.000**	**0.330**	**0.260**	**0.26E+00**	**0.16E+00**	**AnO08d**

24	0.6400	0.640	0.763	0.811	0.816	0.390	0.280	0.43E+00	0.33E+00	ME082d
25	-0.5940	-0.594	0.658	-.903	0.000	0.280	0.270	0.45E+00	-.13E+00	MIS22d
26	**-0.5920**	**-0.592**	**0.632**	**-.936**	**0.000**	**0.260**	**0.280**	**0.43E+00**	**-.11E+00**	**Mid08d**
27	-0.5870	-0.587	0.732	-.836	0.674	0.200	0.290	0.57E+00	-.37E+00	PMD08d
28	0.5750	0.575	0.745	0.785	0.721	0.510	0.280	0.58E+00	0.42E+00	MB011d
29	-0.5680	-0.568	0.665	-.815	0.729	0.190	0.280	0.67E+00	-.51E+00	AVH08d
30	0.5620	0.562	0.595	0.830	0.771	0.400	0.280	0.60E+00	0.17E+00	MGR08d
31	-0.5180	-0.518	0.641	-.826	0.613	0.220	0.310	0.95E+00	-.58E+00	M4D08d
	NH3760_Atla									
1	-0.7910	-0.791	0.810	-.938	0.878	0.280	0.290	0.25E+00	-.54E-01	AS042d
2	-0.7870	-0.787	0.804	-.935	0.880	0.290	0.300	0.26E+00	-.59E-01	AS041d
3	**-0.7850**	**-0.785**	**0.789**	**-.937**	**0.890**	**0.300**	**0.310**	**0.24E+00**	**-.47E-01**	**AnS08d**
4	-0.7800	-0.780	0.792	-.927	0.893	0.290	0.310	0.25E+00	-.69E-01	AS043d
5	-0.7770	-0.777	0.814	-.912	0.891	0.260	0.300	0.30E+00	-.17E+00	AF23pd
6	-0.7750	-0.775	0.785	-.933	0.880	0.290	0.310	0.28E+00	-.73E-01	A7E08d
7	0.7730	0.773	0.793	0.915	0.898	0.340	0.290	0.28E+00	0.15E+00	A4O08d
8	**-0.7720**	**-0.772**	**0.824**	**-.921**	**0.854**	**0.290**	**0.290**	**0.28E+00**	**-.54E-01**	**AnF08d**
9	**-0.7660**	**-0.766**	**0.818**	**-.920**	**0.848**	**0.280**	**0.320**	**0.28E+00**	**-.12E+00**	**Mid08d**
10	-0.7650	-0.765	0.803	-.912	0.875	0.290	0.320	0.29E+00	-.12E+00	AQF08d
11	**0.7640**	**0.764**	**0.847**	**0.905**	**0.842**	**0.350**	**0.300**	**0.29E+00**	**0.13E+00**	**AnO08d**
12	-0.7620	-0.762	0.810	-.918	0.852	0.270	0.300	0.32E+00	-.15E+00	AF142d
13	-0.7610	-0.761	0.775	-.924	0.875	0.290	0.310	0.27E+00	-.82E-01	PO030d
14	0.7590	0.759	0.800	0.920	0.851	0.320	0.310	0.28E+00	0.16E-01	MOC6xd
15	0.7560	0.756	0.809	0.930	0.816	0.340	0.320	0.28E+00	0.58E-01	AO202d
16	-0.7540	-0.754	0.775	-.924	0.858	0.290	0.310	0.30E+00	-.84E-01	ATE08d
17	0.7480	0.748	0.801	0.912	0.841	0.350	0.300	0.32E+00	0.11E+00	AO302d
18	-0.7440	-0.744	0.766	-.929	0.836	0.310	0.320	0.30E+00	-.69E-01	SW002d
19	-0.7310	-0.731	0.746	-.912	0.862	0.280	0.310	0.33E+00	-.16E+00	AS031d
20	-0.7110	-0.711	0.753	-.917	0.798	0.270	0.290	0.34E+00	-.12E+00	AS040d
21	-0.6960	-0.696	0.791	-.877	0.795	0.250	0.310	0.35E+00	-.21E+00	M2B08d
22	**0.6890**	**0.689**	**0.730**	**0.904**	**0.794**	**0.330**	**0.300**	**0.33E+00**	**0.59E-01**	**MO61xd**
23	**0.6870**	**0.687**	**0.744**	**0.896**	**0.791**	**0.360**	**0.280**	**0.40E+00**	**0.17E+00**	**M5B08d**
24	0.6850	0.685	0.728	0.894	0.806	0.340	0.310	0.34E+00	0.56E-01	MOC5Td
25	-0.6820	-0.682	0.744	-.867	0.834	0.260	0.330	0.36E+00	-.22E+00	MIS22d
26	0.6700	0.670	0.665	0.888	0.856	0.340	0.300	0.36E+00	0.70E-01	MGR08d
27	**0.6650**	**0.665**	**0.720**	**0.897**	**0.762**	**0.350**	**0.290**	**0.37E+00**	**0.12E+00**	**M4B08d**
28	-0.6640	-0.664	0.789	-.852	0.770	0.240	0.310	0.40E+00	-.27E+00	M3B08d
29	0.6640	0.664	0.697	0.874	0.830	0.380	0.310	0.35E+00	0.20E+00	ME082d
30	-0.6370	-0.637	0.722	-.843	0.790	0.220	0.310	0.46E+00	-.35E+00	AVH08d
31	-0.6170	-0.617	0.708	-.883	0.689	0.310	0.280	0.41E+00	-.18E-01	MA021d
32	0.5860	0.586	0.696	0.820	0.734	0.450	0.300	0.47E+00	0.33E+00	MB011d
33	**0.5850**	**0.585**	**0.640**	**0.827**	**0.782**	**0.200**	**0.270**	**0.73E+00**	**-.49E+00**	**M6D08d**
34	-0.5250	-0.525	0.572	-.822	0.715	0.220	0.310	0.57E+00	-.44E+00	PMD08d
35	-0.5060	-0.506	0.519	-.809	0.753	0.200	0.300	0.10E+01	-.69E+00	M4D08d
	NH3760_EU_n									
1	**-0.8390**	**-0.839**	**0.886**	**-.927**	**0.926**	**0.260**	**0.310**	**0.23E+00**	**-.16E+00**	**Mid08d**
2	-0.7810	-0.781	0.810	-.924	0.882	0.280	0.290	0.27E+00	-.91E-01	MOC6xd
3	-0.7780	-0.778	0.847	-.926	0.835	0.280	0.280	0.24E+00	-.29E-01	A4O08d
4	**-0.7730**	**-0.773**	**0.867**	**-.906**	**0.839**	**0.250**	**0.280**	**0.30E+00**	**-.19E+00**	**AnS08d**
5	-0.7730	-0.773	0.856	-.883	0.897	0.240	0.280	0.29E+00	-.20E+00	MIS22d
6	-0.7600	-0.760	0.796	-.928	0.843	0.300	0.290	0.28E+00	-.18E-01	MOC5Td
7	**0.7590**	**0.759**	**0.843**	**0.912**	**0.823**	**0.310**	**0.270**	**0.26E+00**	**0.78E-01**	**AnO08d**
8	-0.7590	-0.759	0.873	-.890	0.832	0.240	0.280	0.33E+00	-.24E+00	AS043d
9	**-0.7480**	**-0.748**	**0.796**	**-.917**	**0.835**	**0.290**	**0.290**	**0.29E+00**	**-.57E-01**	**MO61xd**
10	-0.7420	-0.742	0.804	-.915	0.818	0.270	0.290	0.30E+00	-.11E+00	SW002d
11	**-0.7320**	**-0.732**	**0.817**	**-.913**	**0.786**	**0.290**	**0.280**	**0.32E+00**	**-.53E-01**	**M5B08d**
12	-0.7260	-0.726	0.841	-.874	0.821	0.230	0.280	0.35E+00	-.27E+00	AS042d
13	**0.7230**	**0.723**	**0.774**	**0.914**	**0.809**	**0.290**	**0.280**	**0.33E+00**	**-.31E-01**	**M4B08d**
14	-0.7220	-0.722	0.866	-.887	0.766	0.230	0.270	0.37E+00	-.27E+00	AS040d
15	-0.7200	-0.720	0.840	-.853	0.847	0.230	0.290	0.35E+00	-.30E+00	AF142d
16	**-0.7180**	**-0.718**	**0.824**	**-.876**	**0.815**	**0.240**	**0.280**	**0.30E+00**	**-.23E+00**	**AnF08d**
17	-0.7180	-0.718	0.830	-.886	0.792	0.240	0.280	0.32E+00	-.23E+00	ATE08d
18	-0.7170	-0.717	0.821	-.868	0.832	0.230	0.280	0.32E+00	-.26E+00	AF23pd
19	-0.7170	-0.717	0.830	-.872	0.814	0.220	0.270	0.36E+00	-.28E+00	AS041d
20	-0.7140	-0.714	0.814	-.890	0.791	0.240	0.280	0.31E+00	-.22E+00	A7E08d
21	0.7090	0.709	0.756	0.890	0.839	0.340	0.290	0.32E+00	0.11E+00	MGR08d
22	-0.7080	-0.708	0.793	-.898	0.784	0.240	0.270	0.39E+00	-.22E+00	AO302d

23	0.6990	0.699	0.736	0.891	0.837	0.350	0.290	0.33E+00	0.15E+00	ME082d
24	0.6890	0.689	0.741	0.892	0.805	0.310	0.290	0.35E+00	0.38E-02	M2B08d
25	-0.6860	-0.686	0.787	-.886	0.762	0.230	0.280	0.35E+00	-.23E+00	AQF08d
26	0.6820	0.682	0.738	0.892	0.791	0.310	0.290	0.36E+00	-.12E-02	M3B08d
27	-0.6710	-0.671	0.787	-.835	0.821	0.210	0.300	0.47E+00	-.40E+00	AVH08d
28	-0.6690	-0.669	0.642	-.922	0.819	0.300	0.290	0.39E+00	-.73E-03	MA021d
29	-0.6560	-0.656	0.742	-.883	0.744	0.250	0.270	0.36E+00	-.16E+00	AO202d
30	-0.6520	-0.652	0.821	-.817	0.776	0.190	0.270	0.51E+00	-.45E+00	AS031d
31	0.6400	0.640	0.684	0.893	0.752	0.310	0.280	0.42E+00	-.29E-02	SEV08d
32	0.5980	0.598	0.681	0.878	0.681	0.360	0.290	0.42E+00	0.13E+00	MB011d
33	-0.5730	-0.573	0.666	-.860	0.000	0.230	0.260	0.38E+00	-.17E+00	PO030d
34	-0.5090	-0.509	0.604	-.816	0.644	0.200	0.280	0.88E+00	-.57E+00	M4D08d
35	-0.5070	-0.507	0.644	-.823	0.589	0.200	0.280	0.63E+00	-.45E+00	PMD08d
	NH3760_EU_s									
1	-0.7760	-0.776	0.830	-.931	0.836	0.280	0.280	0.25E+00	-.38E-01	PO030d
2	**-0.7610**	**-0.761**	**0.825**	**-.902**	**0.864**	**0.240**	**0.270**	**0.27E+00**	**-.16E+00**	**Mid08d**
3	**-0.7570**	**-0.757**	**0.817**	**-.903**	**0.861**	**0.250**	**0.290**	**0.28E+00**	**-.16E+00**	**AnS08d**
4	-0.7510	-0.751	0.804	-.912	0.842	0.260	0.270	0.29E+00	-.11E+00	MIS22d
5	-0.7430	-0.743	0.793	-.911	0.840	0.300	0.290	0.29E+00	-.26E-01	A4O08d
6	0.7430	0.743	0.803	0.914	0.822	0.320	0.290	0.29E+00	0.48E-01	Gpo08d
7	-0.7410	-0.741	0.814	-.906	0.821	0.270	0.300	0.29E+00	-.15E+00	A7E08d
8	-0.7390	-0.739	0.831	-.872	0.865	0.240	0.290	0.31E+00	-.24E+00	AS041d
9	-0.7390	-0.739	0.808	-.894	0.845	0.250	0.290	0.29E+00	-.17E+00	AS043d
10	-0.7380	-0.738	0.838	-.871	0.856	0.230	0.290	0.33E+00	-.25E+00	AS042d
11	**0.7230**	**0.723**	**0.802**	**0.900**	**0.805**	**0.320**	**0.290**	**0.29E+00**	**0.65E-01**	**AnO08d**
12	-0.7230	-0.723	0.786	-.898	0.823	0.260	0.290	0.32E+00	-.16E+00	MOC6xd
13	-0.7210	-0.721	0.799	-.889	0.824	0.250	0.290	0.32E+00	-.20E+00	ATE08d
14	-0.7140	-0.714	0.777	-.910	0.792	0.280	0.280	0.31E+00	-.57E-01	MGR08d
15	-0.7100	-0.710	0.764	-.910	0.797	0.290	0.290	0.32E+00	-.38E-01	MOC5Td
16	-0.7100	-0.710	0.802	-.882	0.807	0.260	0.300	0.33E+00	-.17E+00	SW002d
17	0.7090	0.709	0.783	0.910	0.774	0.300	0.280	0.33E+00	-.96E-02	AO202d
18	**-0.7030**	**-0.703**	**0.767**	**-.903**	**0.790**	**0.280**	**0.290**	**0.35E+00**	**-.87E-01**	**MO61xd**
19	**-0.7020**	**-0.702**	**0.805**	**-.867**	**0.815**	**0.240**	**0.290**	**0.37E+00**	**-.24E+00**	**AnF08d**
20	-0.7010	-0.701	0.744	-.910	0.797	0.270	0.280	0.41E+00	-.11E+00	MA021d
21	-0.7000	-0.700	0.795	-.884	0.789	0.240	0.280	0.34E+00	-.21E+00	AQF08d
22	-0.6930	-0.693	0.788	-.874	0.798	0.240	0.280	0.36E+00	-.20E+00	AF142d
23	-0.6910	-0.691	0.794	-.869	0.797	0.240	0.290	0.37E+00	-.23E+00	AF23pd
24	0.6910	0.691	0.749	0.892	0.801	0.290	0.280	0.37E+00	-.24E-01	AO302d
25	0.6900	0.690	0.759	0.895	0.784	0.330	0.290	0.33E+00	0.80E-01	SEV08d
26	-0.6820	-0.682	0.781	-.858	0.810	0.230	0.290	0.38E+00	-.28E+00	AVH08d
27	-0.6810	-0.681	0.790	-.844	0.824	0.210	0.290	0.42E+00	-.35E+00	AS040d
28	0.6740	0.674	0.734	0.908	0.752	0.300	0.290	0.32E+00	0.50E-02	ME082d
29	-0.6330	-0.633	0.710	-.881	0.727	0.300	0.290	0.34E+00	-.72E-02	M2B08d
30	**0.6160**	**0.616**	**0.669**	**0.883**	**0.727**	**0.300**	**0.280**	**0.45E+00**	**-.72E-01**	**M4B08d**
31	-0.6080	-0.608	0.736	-.785	0.816	0.180	0.280	0.59E+00	-.50E+00	AS031d
32	-0.6070	-0.607	0.687	-.862	0.723	0.250	0.290	0.44E+00	-.17E+00	MB011d
33	-0.5950	-0.595	0.674	-.858	0.714	0.280	0.290	0.41E+00	-.94E-01	M3B08d
34	**-0.5890**	**-0.589**	**0.681**	**-.870**	**0.672**	**0.260**	**0.280**	**0.53E+00**	**-.20E+00**	**M5B08d**
35	-0.5510	-0.551	0.647	-.835	0.674	0.210	0.290	0.51E+00	-.35E+00	PMD08d
36	-0.4880	-0.488	0.574	-.803	0.644	0.200	0.290	0.87E+00	-.59E+00	M4D08d
37	**-0.4800**	**-0.480**	**0.665**	**-.704**	**0.699**	**0.061**	**0.260**	**0.14E+01**	**-.13E+01**	**M6D08d**
	NH1237_Am_w									
1	-0.7590	-0.759	0.806	-.942	0.000	0.250	0.250	0.29E+00	-.52E-01	PO030d
2	0.7430	0.743	0.000	0.881	0.843	0.280	0.330	0.34E+00	-.15E+00	MGR08d
3	-0.7170	-0.717	0.806	-.893	0.801	0.260	0.290	0.34E+00	-.14E+00	MOC6xd
4	-0.7030	-0.703	0.779	-.907	0.772	0.320	0.290	0.37E+00	0.28E-01	MOC5Td
5	-0.6930	-0.693	0.791	-.865	0.812	0.240	0.290	0.39E+00	-.26E+00	MB011d
6	-0.6920	-0.692	0.813	-.900	0.726	0.250	0.290	0.34E+00	-.17E+00	AVH08d
7	-0.6720	-0.672	0.823	-.817	0.000	0.180	0.250	0.43E+00	-.33E+00	SW002d
8	-0.6680	-0.668	0.720	-.929	0.000	0.250	0.260	0.37E+00	-.11E+00	MA021d
9	**-0.6300**	**-0.630**	**0.797**	**-.881**	**0.641**	**0.270**	**0.280**	**0.42E+00**	**-.13E+00**	**MO61xd**
10	0.6120	0.612	0.670	0.914	0.000	0.310	0.310	0.42E+00	-.61E-01	PMD08d
11	**0.6040**	**0.604**	**0.000**	**0.796**	**0.758**	**0.200**	**0.320**	**0.67E+00**	**-.48E+00**	**M4B08d**
12	-0.5820	-0.582	0.712	-.774	0.795	0.170	0.310	0.79E+00	-.65E+00	M3B08d
13	-0.5550	-0.555	0.695	-.772	0.744	0.220	0.300	0.67E+00	-.43E+00	M2B08d
14	-0.4590	-0.459	0.588	-.780	0.000	0.230	0.280	0.42E+00	-.20E+00	MIS22d
15	-0.4130	-0.413	0.490	-.844	0.000	0.200	0.290	0.57E+00	-.43E+00	AO302d

NH1237_Am_e

1	-0.7640	-0.764	0.816	-.892	0.898	0.280	0.320	0.28E+00	-.17E+00	Mid08d
2	-0.7620	-0.762	0.843	-.904	0.000	0.300	0.310	0.31E+00	-.12E+00	AnO08d
3	-0.7560	-0.756	0.808	-.906	0.863	0.290	0.320	0.32E+00	-.14E+00	MGR08d
4	0.7480	0.748	0.794	0.923	0.827	0.350	0.340	0.29E+00	0.86E-02	ME082d
5	-0.7420	-0.742	0.855	-.879	0.832	0.300	0.300	0.37E+00	-.94E-01	A4O08d
6	-0.7350	-0.735	0.797	-.898	0.840	0.270	0.300	0.34E+00	-.19E+00	ATE08d
7	0.7270	0.727	0.829	0.893	0.800	0.380	0.290	0.33E+00	0.16E+00	PO030d
8	-0.7240	-0.724	0.819	-.893	0.801	0.280	0.310	0.35E+00	-.16E+00	A7E08d
9	-0.7240	-0.724	0.811	-.893	0.000	0.350	0.300	0.34E+00	0.39E-01	MA021d
10	-0.7200	-0.720	0.836	-.861	0.000	0.260	0.300	0.37E+00	-.20E+00	AnS08d
11	-0.7150	-0.715	0.807	-.877	0.822	0.290	0.320	0.32E+00	-.13E+00	MIS22d
12	-0.7140	-0.714	0.824	-.866	0.000	0.260	0.300	0.37E+00	-.22E+00	AS043d
13	-0.7120	-0.712	0.778	-.851	0.899	0.270	0.300	0.41E+00	-.20E+00	AF23pd
14	-0.7090	-0.709	0.802	-.889	0.793	0.310	0.340	0.37E+00	-.14E+00	MOC5Td
15	-0.7020	-0.702	0.821	-.856	0.000	0.270	0.300	0.43E+00	-.21E+00	AO302d
16	-0.6960	-0.696	0.770	-.853	0.864	0.240	0.290	0.47E+00	-.27E+00	AF142d
17	-0.6930	-0.693	0.798	-.868	0.000	0.240	0.290	0.42E+00	-.25E+00	AO202d
18	-0.6910	-0.691	0.828	-.864	0.773	0.280	0.330	0.40E+00	-.24E+00	MOC6xd
19	-0.6830	-0.683	0.804	-.849	0.000	0.260	0.300	0.42E+00	-.21E+00	AnF08d
20	-0.6830	-0.683	0.808	-.845	0.000	0.230	0.300	0.49E+00	-.33E+00	AQF08d
21	-0.6730	-0.673	0.807	-.833	0.000	0.240	0.300	0.40E+00	-.29E+00	AS042d
22	-0.6730	-0.673	0.817	-.839	0.788	0.250	0.330	0.44E+00	-.35E+00	AVH08d
23	-0.6700	-0.670	0.801	-.836	0.803	0.230	0.330	0.47E+00	-.39E+00	SW002d
24	-0.6670	-0.667	0.742	-.873	0.787	0.300	0.340	0.46E+00	-.20E+00	PMD08d
25	-0.6530	-0.653	0.750	-.842	0.801	0.230	0.340	0.46E+00	-.36E+00	M3B08d
26	-0.6410	-0.641	0.730	-.851	0.777	0.240	0.340	0.42E+00	-.31E+00	M2B08d
27	-0.6260	-0.626	0.755	-.841	0.733	0.250	0.320	0.45E+00	-.28E+00	AS040d
28	-0.6070	-0.607	0.754	-.804	0.000	0.220	0.300	0.47E+00	-.35E+00	AS041d
29	-0.6060	-0.606	0.780	-.849	0.654	0.260	0.330	0.60E+00	-.36E+00	MO61xd
30	-0.5990	-0.599	0.719	-.849	0.692	0.300	0.340	0.46E+00	-.13E+00	MB011d
31	-0.5880	-0.588	0.747	-.838	0.660	0.280	0.350	0.52E+00	-.30E+00	M4B08d
32	-0.5560	-0.556	0.710	-.783	0.000	0.190	0.290	0.62E+00	-.50E+00	AS031d
33	-0.5450	-0.545	0.625	-.822	0.702	0.200	0.330	0.91E+00	-.70E+00	M4D08d
34	-0.5380	-0.538	0.718	-.799	0.632	0.210	0.270	0.59E+00	-.35E+00	M5B08d
35	-0.4300	-0.430	0.570	-.727	0.613	0.150	0.260	0.11E+01	-.89E+00	M6D08d

NH1237_Af_w

1	0.8050	0.805	0.897	0.914	0.864	0.520	0.490	0.28E+00	0.37E-01	AnS08d
2	0.7900	0.790	0.894	0.910	0.842	0.530	0.480	0.32E+00	0.45E-01	AS043d
3	0.7890	0.789	0.864	0.918	0.855	0.470	0.470	0.27E+00	-.11E-02	Mid08d
4	0.7830	0.783	0.846	0.913	0.869	0.440	0.430	0.29E+00	0.22E-01	MA021d
5	0.7810	0.781	0.896	0.892	0.855	0.540	0.490	0.31E+00	0.65E-01	AS042d
6	-0.7760	-0.776	0.864	-.912	0.839	0.480	0.490	0.31E+00	-.54E-01	ATE08d
7	0.7750	0.775	0.888	0.894	0.846	0.560	0.490	0.31E+00	0.83E-01	AS041d
8	0.7740	0.774	0.874	0.896	0.855	0.530	0.450	0.29E+00	0.13E+00	AnO08d
9	-0.7720	-0.772	0.838	-.921	0.837	0.440	0.460	0.30E+00	-.77E-01	SW002d
10	-0.7710	-0.771	0.894	-.887	0.845	0.430	0.490	0.36E+00	-.18E+00	AS031d
11	0.7700	0.770	0.857	0.906	0.844	0.480	0.460	0.28E+00	0.45E-01	MIS22d
12	0.7690	0.769	0.881	0.902	0.827	0.490	0.470	0.32E+00	0.13E-02	AO302d
13	0.7680	0.768	0.852	0.913	0.832	0.470	0.470	0.33E+00	-.44E-01	A7E08d
14	-0.7680	-0.768	0.863	-.920	0.808	0.420	0.450	0.31E+00	-.66E-01	MOC6xd
15	0.7660	0.766	0.878	0.890	0.845	0.530	0.480	0.33E+00	0.41E-01	AS040d
16	-0.7660	-0.766	0.849	-.914	0.826	0.410	0.420	0.32E+00	-.70E-01	MOC5Td
17	0.7640	0.764	0.861	0.891	0.854	0.470	0.390	0.28E+00	0.16E+00	PO030d
18	-0.7570	-0.757	0.856	-.899	0.827	0.450	0.450	0.30E+00	-.41E-01	AO202d
19	0.7540	0.754	0.852	0.916	0.794	0.460	0.450	0.33E+00	-.13E-01	MO61xd
20	-0.7490	-0.749	0.863	-.887	0.826	0.360	0.410	0.39E+00	-.22E+00	AnF08d
21	-0.7490	-0.749	0.859	-.890	0.825	0.370	0.420	0.35E+00	-.18E+00	AQF08d
22	-0.7350	-0.735	0.842	-.902	0.788	0.460	0.460	0.33E+00	-.74E-02	Gpo08d
23	-0.7260	-0.726	0.869	-.872	0.797	0.360	0.410	0.39E+00	-.19E+00	AF142d
24	-0.7190	-0.719	0.865	-.873	0.784	0.360	0.410	0.40E+00	-.23E+00	AF23pd
25	0.7050	0.705	0.794	0.891	0.787	0.530	0.470	0.36E+00	0.11E+00	MGR08d
26	0.7040	0.704	0.779	0.890	0.804	0.410	0.370	0.37E+00	0.72E-01	SEV08d
27	-0.6950	-0.695	0.785	-.884	0.787	0.370	0.430	0.36E+00	-.15E+00	ME082d
28	-0.6940	-0.694	0.823	-.873	0.768	0.440	0.470	0.41E+00	-.11E+00	A4O08d
29	-0.6720	-0.672	0.719	-.892	0.789	0.440	0.480	0.38E+00	-.68E-01	M2B08d
30	-0.6700	-0.670	0.760	-.875	0.772	0.380	0.470	0.42E+00	-.21E+00	M4B08d

31	-0.6630	-0.663	0.709	-.890	0.782	0.440	0.480	0.41E+00	-.83E-01	M3B08d
32	**-0.6500**	**-0.650**	**0.748**	**-.860**	**0.765**	**0.380**	**0.470**	**0.44E+00**	**-.23E+00**	**M5B08d**
33	-0.6160	-0.616	0.761	-.851	0.687	0.390	0.450	0.52E+00	-.20E+00	AVH08d
34	-0.5570	-0.557	0.721	-.757	0.751	0.230	0.470	0.66E+00	-.59E+00	MB011d
35	**-0.5500**	**-0.550**	**0.660**	**-.807**	**0.704**	**0.280**	**0.430**	**0.88E+00**	**-.67E+00**	**M6D08d**
36	-0.5370	-0.537	0.618	-.856	0.636	0.420	0.470	0.72E+00	-.31E+00	M4D08d
37	-0.5020	-0.502	0.605	-.800	0.651	0.300	0.460	0.67E+00	-.47E+00	PMD08d
	NH1237_Af_e									
1	0.8090	0.809	0.867	0.923	0.886	0.440	0.420	0.22E+00	0.41E-01	MIS22d
2	0.8090	0.809	0.875	0.910	0.902	0.490	0.420	0.22E+00	0.13E+00	PO030d
3	**-0.8080**	**-0.808**	**0.861**	**-.928**	**0.881**	**0.430**	**0.420**	**0.22E+00**	**0.15E-02**	**Mid08d**
4	0.7840	0.784	0.841	0.906	0.890	0.490	0.460	0.31E+00	-.31E-01	AQF08d
5	0.7730	0.773	0.818	0.910	0.884	0.500	0.430	0.28E+00	0.11E+00	MA021d
6	0.7730	0.773	0.866	0.897	0.857	0.510	0.450	0.28E+00	0.12E+00	MOC5Td
7	0.7640	0.764	0.825	0.912	0.851	0.480	0.460	0.29E+00	0.47E-01	Gpo08d
8	0.7620	0.762	0.837	0.901	0.855	0.490	0.450	0.30E+00	0.38E-01	ATE08d
9	0.7600	0.760	0.825	0.898	0.868	0.380	0.330	0.26E+00	0.11E+00	SEV08d
10	0.7590	0.759	0.847	0.889	0.861	0.490	0.460	0.33E+00	-.60E-01	AF23pd
11	**0.7570**	**0.757**	**0.811**	**0.913**	**0.849**	**0.480**	**0.450**	**0.29E+00**	**0.44E-01**	**AnS08d**
12	-0.7560	-0.756	0.828	-.919	0.818	0.350	0.390	0.29E+00	-.79E-01	ME082d
13	0.7500	0.750	0.811	0.894	0.868	0.490	0.470	0.32E+00	-.55E-01	AF142d
14	0.7500	0.750	0.804	0.914	0.838	0.450	0.430	0.31E+00	0.20E-01	AO202d
15	0.7450	0.745	0.822	0.906	0.823	0.490	0.450	0.32E+00	0.59E-01	MOC6xd
16	0.7410	0.741	0.805	0.901	0.839	0.500	0.440	0.33E+00	0.89E-01	A7E08d
17	0.7410	0.741	0.797	0.919	0.815	0.430	0.410	0.32E+00	0.60E-02	SW002d
18	0.7390	0.739	0.813	0.897	0.834	0.450	0.450	0.33E+00	0.59E-02	AS041d
19	0.7380	0.738	0.817	0.897	0.829	0.450	0.440	0.32E+00	-.97E-02	AS042d
20	**0.7370**	**0.737**	**0.830**	**0.879**	**0.846**	**0.520**	**0.410**	**0.32E+00**	**0.18E+00**	**AnO08d**
21	0.7360	0.736	0.819	0.906	0.807	0.480	0.460	0.34E+00	0.23E-01	AO302d
22	0.7350	0.735	0.804	0.898	0.833	0.500	0.450	0.33E+00	0.86E-01	AS043d
23	-0.7300	-0.730	0.853	-.874	0.818	0.400	0.450	0.39E+00	-.23E+00	AS031d
24	**-0.7250**	**-0.725**	**0.834**	**-.881**	**0.812**	**0.430**	**0.440**	**0.37E+00**	**-.15E+00**	**AnF08d**
25	**0.7150**	**0.715**	**0.795**	**0.893**	**0.805**	**0.490**	**0.460**	**0.36E+00**	**0.55E-01**	**MO61xd**
26	0.7080	0.708	0.803	0.889	0.791	0.490	0.470	0.38E+00	0.15E-01	A4O08d
27	0.7040	0.704	0.809	0.883	0.787	0.420	0.430	0.38E+00	-.66E-01	AS040d
28	-0.7030	-0.703	0.779	-.880	0.818	0.470	0.460	0.39E+00	-.72E-01	AVH08d
29	-0.6790	-0.679	0.743	-.892	0.780	0.370	0.440	0.38E+00	-.13E+00	MGR08d
30	**-0.6510**	**-0.651**	**0.751**	**-.880**	**0.727**	**0.380**	**0.440**	**0.45E+00**	**-.17E+00**	**M5B08d**
31	-0.6410	-0.641	0.670	-.892	0.771	0.340	0.400	0.43E+00	-.19E+00	PMD08d
32	0.6300	0.630	0.665	0.887	0.759	0.450	0.440	0.39E+00	0.20E-01	M2B08d
33	0.6170	0.617	0.660	0.886	0.736	0.450	0.450	0.43E+00	-.76E-02	M3B08d
34	-0.6150	-0.615	0.717	-.808	0.809	0.260	0.460	0.52E+00	-.46E+00	MB011d
35	**-0.5940**	**-0.594**	**0.663**	**-.879**	**0.688**	**0.380**	**0.450**	**0.49E+00**	**-.16E+00**	**M4B08d**
36	-0.5430	-0.543	0.614	-.852	0.660	0.440	0.460	0.70E+00	-.21E+00	M4D08d
37	**-0.5430**	**-0.543**	**0.666**	**-.798**	**0.696**	**0.360**	**0.470**	**0.78E+00**	**-.46E+00**	**M6D08d**
	NH1237_As_n									
1	**-0.8070**	**-0.807**	**0.885**	**-.929**	**0.853**	**0.440**	**0.430**	**0.28E+00**	**-.16E-01**	**AnO08d**
2	**-0.7880**	**-0.788**	**0.860**	**-.909**	**0.875**	**0.390**	**0.440**	**0.31E+00**	**-.18E+00**	**AnS08d**
3	-0.7800	-0.780	0.853	-.900	0.878	0.390	0.440	0.31E+00	-.20E+00	AS043d
4	0.7790	0.779	0.823	0.924	0.862	0.430	0.410	0.26E+00	0.13E-01	PO030d
5	-0.7760	-0.776	0.855	-.905	0.860	0.480	0.470	0.31E+00	-.46E-01	A4O08d
6	**-0.7690**	**-0.769**	**0.870**	**-.893**	**0.851**	**0.370**	**0.440**	**0.28E+00**	**-.19E+00**	**Mid08d**
7	-0.7650	-0.765	0.848	-.901	0.850	0.440	0.470	0.36E+00	-.14E+00	MOC6xd
8	-0.7580	-0.758	0.855	-.892	0.844	0.410	0.470	0.33E+00	-.20E+00	A7E08d
9	0.7530	0.753	0.833	0.905	0.831	0.500	0.460	0.33E+00	0.34E-01	MOC5Td
10	**-0.7470**	**-0.747**	**0.835**	**-.903**	**0.819**	**0.440**	**0.480**	**0.39E+00**	**-.16E+00**	**MO61xd**
11	-0.7440	-0.744	0.846	-.868	0.868	0.360	0.470	0.34E+00	-.28E+00	AS041d
12	0.7430	0.743	0.780	0.914	0.847	0.410	0.410	0.25E+00	-.38E-01	Gpo08d
13	-0.7400	-0.740	0.857	-.891	0.805	0.370	0.450	0.31E+00	-.20E+00	MIS22d
14	0.7380	0.738	0.813	0.906	0.818	0.490	0.480	0.30E+00	0.19E-01	ME082d
15	**-0.7370**	**-0.737**	**0.853**	**-.868**	**0.845**	**0.380**	**0.470**	**0.41E+00**	**-.30E+00**	**AnF08d**
16	0.7320	0.732	0.776	0.888	0.876	0.450	0.450	0.38E+00	-.38E-01	M5B08d
17	-0.7300	-0.730	0.848	-.856	0.857	0.340	0.460	0.37E+00	-.31E+00	AS042d
18	-0.7290	-0.729	0.862	-.854	0.844	0.340	0.440	0.37E+00	-.29E+00	ATE08d
19	-0.7190	-0.719	0.839	-.860	0.832	0.350	0.460	0.42E+00	-.33E+00	AF142d
20	-0.7190	-0.719	0.829	-.865	0.835	0.380	0.460	0.41E+00	-.26E+00	AVH08d
21	-0.7180	-0.718	0.839	-.861	0.830	0.360	0.460	0.42E+00	-.31E+00	AF23pd

22	0.7180	0.718	0.789	0.887	0.831	0.490	0.410	0.34E+00	0.14E+00	MA021d
23	**0.7170**	**0.717**	**0.769**	**0.894**	**0.836**	**0.460**	**0.430**	**0.38E+00**	**-.19E-01**	**M4B08d**
24	-0.7160	-0.716	0.798	-.875	0.839	0.340	0.420	0.43E+00	-.27E+00	SW002d
25	-0.7020	-0.702	0.825	-.855	0.817	0.360	0.470	0.46E+00	-.36E+00	AQF08d
26	-0.7020	-0.702	0.821	-.846	0.838	0.350	0.490	0.41E+00	-.35E+00	AS040d
27	-0.6850	-0.685	0.821	-.811	0.869	0.280	0.410	0.55E+00	-.48E+00	AS031d
28	-0.6850	-0.685	0.765	-.872	0.806	0.360	0.410	0.37E+00	-.17E+00	MGR08d
29	-0.6770	-0.677	0.729	-.895	0.784	0.440	0.450	0.38E+00	-.29E-01	M2B08d
30	-0.6730	-0.673	0.730	-.892	0.781	0.440	0.450	0.38E+00	-.41E-01	M3B08d
31	-0.6720	-0.672	0.835	-.853	0.744	0.390	0.390	0.47E+00	-.16E+00	AO302d
32	-0.6690	-0.669	0.772	-.855	0.793	0.380	0.470	0.45E+00	-.24E+00	MB011d
33	-0.6620	-0.662	0.823	-.836	0.762	0.400	0.410	0.44E+00	-.15E+00	AO202d
34	-0.5040	-0.504	0.601	-.835	0.605	0.380	0.420	0.57E+00	-.17E+00	PMD08d
35	-0.5010	-0.501	0.664	-.752	0.669	0.230	0.490	0.10E+01	-.89E+00	M4D08d
36	**-0.4550**	**-0.455**	**0.584**	**-.709**	**0.704**	**0.200**	**0.450**	**0.11E+01**	**-.90E+00**	**M6D08d**

NH1237_As_s

1	**0.8290**	**0.829**	**0.917**	**0.930**	**0.868**	**0.640**	**0.610**	**0.24E+00**	**0.22E-01**	**AnO08d**
2	-0.8140	-0.814	0.897	-.926	0.861	0.560	0.600	0.27E+00	-.10E+00	A4O08d
3	-0.8140	-0.814	0.890	-.931	0.859	0.570	0.580	0.25E+00	-.37E-01	A7E08d
4	-0.8100	-0.810	0.887	-.917	0.880	0.600	0.570	0.26E+00	0.65E-02	AS043d
5	-0.8090	-0.809	0.879	-.929	0.863	0.510	0.540	0.26E+00	-.97E-01	ATE08d
6	**0.8060**	**0.806**	**0.881**	**0.915**	**0.880**	**0.600**	**0.570**	**0.26E+00**	**0.15E-01**	**AnS08d**
7	-0.7990	-0.799	0.872	-.912	0.879	0.620	0.700	0.27E+00	-.14E+00	Gpo08d
8	-0.7980	-0.798	0.866	-.930	0.851	0.560	0.570	0.26E+00	-.43E-01	AS042d
9	-0.7970	-0.797	0.857	-.927	0.863	0.570	0.580	0.27E+00	-.43E-01	AS040d
10	-0.7970	-0.797	0.870	-.928	0.848	0.560	0.570	0.26E+00	-.41E-01	AS041d
11	**-0.7880**	**-0.788**	**0.889**	**-.884**	**0.895**	**0.490**	**0.630**	**0.32E+00**	**-.25E+00**	**Mid08d**
12	**-0.7830**	**-0.783**	**0.876**	**-.910**	**0.846**	**0.530**	**0.560**	**0.30E+00**	**-.88E-01**	**M4B08d**
13	-0.7790	-0.779	0.859	-.903	0.866	0.410	0.470	0.28E+00	-.19E+00	AO302d
14	-0.7790	-0.779	0.865	-.910	0.847	0.550	0.570	0.30E+00	-.61E-01	M5B08d
15	**-0.7750**	**-0.775**	**0.895**	**-.892**	**0.845**	**0.520**	**0.590**	**0.39E+00**	**-.19E+00**	**AnF08d**
16	-0.7660	-0.766	0.893	-.881	0.846	0.470	0.580	0.39E+00	-.26E+00	AF142d
17	-0.7640	-0.764	0.868	-.903	0.827	0.550	0.580	0.36E+00	-.11E+00	MOC5Td
18	-0.7620	-0.762	0.856	-.894	0.848	0.410	0.480	0.30E+00	-.19E+00	AO202d
19	-0.7610	-0.761	0.896	-.873	0.848	0.490	0.600	0.41E+00	-.27E+00	AF23pd
20	-0.7610	-0.761	0.872	-.891	0.836	0.480	0.570	0.34E+00	-.20E+00	MOC6xd
21	-0.7600	-0.760	0.872	-.889	0.838	0.500	0.600	0.40E+00	-.25E+00	AQF08d
22	-0.7590	-0.759	0.863	-.866	0.889	0.470	0.610	0.34E+00	-.26E+00	MIS22d
23	**-0.7480**	**-0.748**	**0.856**	**-.897**	**0.812**	**0.530**	**0.580**	**0.38E+00**	**-.15E+00**	**MO61xd**
24	-0.7230	-0.723	0.826	-.870	0.834	0.460	0.580	0.36E+00	-.21E+00	ME082d
25	-0.7100	-0.710	0.856	-.830	0.856	0.360	0.500	0.40E+00	-.37E+00	AS031d
26	-0.7090	-0.709	0.826	-.864	0.816	0.530	0.540	0.36E+00	-.81E-01	MGR08d
27	-0.7080	-0.708	0.825	-.867	0.808	0.520	0.570	0.39E+00	-.15E+00	AVH08d
28	-0.7000	-0.700	0.804	-.857	0.831	0.460	0.600	0.42E+00	-.32E+00	SW002d
29	-0.6450	-0.645	0.716	-.857	0.792	0.410	0.580	0.45E+00	-.31E+00	M3B08d
30	-0.6360	-0.636	0.701	-.858	0.782	0.420	0.580	0.45E+00	-.31E+00	M2B08d
31	**-0.6090**	**-0.609**	**0.838**	**-.747**	**0.793**	**0.330**	**0.600**	**0.76E+00**	**-.74E+00**	**M6D08d**
32	-0.6050	-0.605	0.755	-.793	0.771	0.350	0.590	0.70E+00	-.57E+00	PMD08d
33	-0.5880	-0.588	0.714	-.810	0.737	0.400	0.590	0.59E+00	-.39E+00	MB011d
34	-0.5600	-0.560	0.719	-.793	0.693	0.360	0.590	0.82E+00	-.66E+00	M4D08d

EQ1220_Amer

1	-0.8050	-0.805	0.862	-.918	0.893	0.430	0.430	0.29E+00	-.59E-01	AS042d
2	-0.7940	-0.794	0.860	-.912	0.881	0.430	0.430	0.30E+00	-.80E-01	AS041d
3	-0.7870	-0.787	0.862	-.909	0.869	0.430	0.420	0.32E+00	-.64E-01	AS040d
4	-0.7790	-0.779	0.839	-.907	0.878	0.380	0.420	0.37E+00	-.16E+00	AQF08d
5	**-0.7780**	**-0.778**	**0.869**	**-.866**	**0.929**	**0.340**	**0.440**	**0.33E+00**	**-.28E+00**	**Mid08d**
6	-0.7760	-0.776	0.852	-.914	0.847	0.420	0.430	0.32E+00	-.55E-01	A7E08d
7	-0.7670	-0.767	0.836	-.910	0.850	0.360	0.380	0.34E+00	-.14E+00	MOC5Td
8	-0.7660	-0.766	0.852	-.895	0.859	0.340	0.380	0.39E+00	-.23E+00	MOC6xd
9	-0.7650	-0.765	0.815	-.937	0.818	0.400	0.420	0.29E+00	-.15E-01	ME082d
10	-0.7640	-0.764	0.830	-.908	0.853	0.360	0.370	0.30E+00	-.71E-01	MGR08d
11	-0.7620	-0.762	0.842	-.907	0.839	0.380	0.410	0.31E+00	-.96E-01	ATE08d
12	-0.7580	-0.758	0.845	-.874	0.889	0.480	0.420	0.37E+00	0.44E-01	AS043d
13	-0.7570	-0.757	0.835	-.882	0.881	0.360	0.440	0.43E+00	-.29E+00	AF142d
14	-0.7550	-0.755	0.809	-.909	0.853	0.380	0.400	0.38E+00	-.13E+00	M2B08d
15	-0.7530	-0.753	0.842	-.888	0.854	0.360	0.410	0.44E+00	-.26E+00	SW002d
16	-0.7490	-0.749	0.822	-.892	0.857	0.370	0.430	0.41E+00	-.23E+00	AF23pd

17	-0.7490	-0.749	0.849	-.863	0.887	0.500	0.430	0.39E+00	0.76E-01	AnS08d
18	-0.7450	-0.745	0.841	-.888	0.836	0.380	0.380	0.35E+00	-.11E+00	AnO08d
19	-0.7450	-0.745	0.811	-.903	0.840	0.380	0.400	0.37E+00	-.14E+00	M3B08d
20	-0.7430	-0.743	0.810	-.895	0.852	0.380	0.430	0.40E+00	-.19E+00	AnF08d
21	-0.7430	-0.743	0.840	-.888	0.834	0.370	0.400	0.40E+00	-.17E+00	AO302d
22	-0.7410	-0.741	0.859	-.885	0.817	0.320	0.380	0.41E+00	-.26E+00	MO61xd
23	-0.7380	-0.738	0.815	-.891	0.840	0.340	0.410	0.39E+00	-.26E+00	M4B08d
24	-0.7330	-0.733	0.839	-.877	0.834	0.340	0.410	0.43E+00	-.27E+00	A4O08d
25	-0.7320	-0.732	0.845	-.873	0.832	0.330	0.440	0.43E+00	-.34E+00	M5B08d
26	-0.7200	-0.720	0.833	-.879	0.807	0.310	0.390	0.45E+00	-.33E+00	AS031d
27	-0.7150	-0.715	0.810	-.872	0.830	0.300	0.390	0.43E+00	-.32E+00	AO202d
28	-0.7130	-0.713	0.824	-.853	0.850	0.310	0.400	0.53E+00	-.39E+00	AVH08d
29	-0.6800	-0.680	0.804	-.846	0.000	0.180	0.270	0.45E+00	-.39E+00	MA021d
30	-0.6750	-0.675	0.798	-.812	0.867	0.300	0.430	0.46E+00	-.38E+00	MIS22d
31	-0.6630	-0.663	0.731	-.876	0.784	0.430	0.390	0.42E+00	0.29E-01	MB011d
32	-0.6120	-0.612	0.660	-.860	0.767	0.320	0.400	0.54E+00	-.30E+00	PMD08d
33	-0.5580	-0.558	0.673	-.854	0.634	0.360	0.410	0.79E+00	-.37E+00	M4D08d
34	-0.5430	-0.543	0.784	-.778	0.622	0.230	0.410	0.82E+00	-.69E+00	M6D08d
	EQ1220_Afri									
1	0.8230	0.823	0.879	0.937	0.000	0.310	0.330	0.24E+00	-.79E-01	MA021d
2	-0.8140	-0.814	0.886	-.919	0.000	0.380	0.330	0.20E+00	0.97E-01	PO030d
3	-0.8110	-0.811	0.852	-.918	0.916	0.370	0.400	0.33E+00	-.15E+00	AnS08d
4	-0.8070	-0.807	0.854	-.913	0.915	0.370	0.400	0.34E+00	-.18E+00	AS043d
5	-0.8030	-0.803	0.891	-.911	0.872	0.520	0.520	0.27E+00	0.30E-01	Gpo08d
6	-0.7960	-0.796	0.893	-.898	0.879	0.490	0.590	0.31E+00	-.20E+00	MOC6xd
7	-0.7940	-0.794	0.893	-.874	0.924	0.360	0.440	0.28E+00	-.22E+00	Mid08d
8	-0.7890	-0.789	0.853	-.896	0.911	0.420	0.470	0.29E+00	-.14E+00	AnO08d
9	-0.7890	-0.789	0.897	-.884	0.888	0.360	0.440	0.28E+00	-.21E+00	MIS22d
10	-0.7790	-0.779	0.867	-.906	0.852	0.540	0.570	0.31E+00	-.89E-01	MO61xd
11	0.7730	0.773	0.877	0.898	0.845	0.400	0.390	0.28E+00	0.24E-01	MGR08d
12	-0.7640	-0.764	0.853	-.896	0.852	0.440	0.540	0.36E+00	-.22E+00	MOC5Td
13	-0.7410	-0.741	0.897	-.856	0.837	0.490	0.610	0.42E+00	-.31E+00	AVH08d
14	-0.7350	-0.735	0.813	-.884	0.850	0.440	0.540	0.41E+00	-.15E+00	M2B08d
15	-0.7350	-0.735	0.815	-.889	0.838	0.390	0.480	0.34E+00	-.12E+00	ME082d
16	-0.7340	-0.734	0.861	-.856	0.853	0.380	0.560	0.44E+00	-.37E+00	M4B08d
17	-0.7310	-0.731	0.867	-.841	0.872	0.360	0.480	0.40E+00	-.34E+00	SW002d
18	-0.7300	-0.730	0.800	-.884	0.852	0.450	0.560	0.43E+00	-.16E+00	M3B08d
19	-0.7300	-0.730	0.910	-.842	0.827	0.330	0.460	0.43E+00	-.38E+00	M5B08d
20	-0.7240	-0.724	0.842	-.860	0.840	0.310	0.380	0.40E+00	-.26E+00	A4O08d
21	-0.7140	-0.714	0.815	-.841	0.886	0.340	0.420	0.49E+00	-.32E+00	A7E08d
22	-0.7140	-0.714	0.800	-.842	0.897	0.300	0.410	0.52E+00	-.40E+00	ATE08d
23	-0.7120	-0.712	0.809	-.849	0.870	0.250	0.320	0.44E+00	-.34E+00	AO302d
24	-0.6860	-0.686	0.748	-.834	0.904	0.290	0.410	0.47E+00	-.39E+00	AS042d
25	-0.6810	-0.681	0.756	-.832	0.886	0.290	0.420	0.47E+00	-.38E+00	AS041d
26	-0.6700	-0.670	0.734	-.848	0.851	0.300	0.420	0.47E+00	-.35E+00	AS040d
27	-0.6660	-0.666	0.775	-.812	0.869	0.240	0.330	0.50E+00	-.42E+00	AO202d
28	-0.6420	-0.642	0.752	-.860	0.740	0.330	0.450	0.49E+00	-.30E+00	PMD08d
29	-0.6380	-0.638	0.754	-.792	0.860	0.280	0.430	0.62E+00	-.51E+00	AF23pd
30	-0.6350	-0.635	0.747	-.795	0.853	0.290	0.430	0.62E+00	-.49E+00	AnF08d
31	-0.6310	-0.631	0.767	-.774	0.866	0.270	0.440	0.65E+00	-.57E+00	AQF08d
32	-0.6290	-0.629	0.743	-.785	0.865	0.230	0.410	0.65E+00	-.57E+00	AF142d
33	-0.6020	-0.602	0.682	-.815	0.799	0.290	0.510	0.58E+00	-.42E+00	MB011d
34	-0.5710	-0.571	0.699	-.834	0.670	0.420	0.570	0.79E+00	-.41E+00	M4D08d
35	-0.5670	-0.567	0.676	-.748	0.852	0.170	0.330	0.78E+00	-.74E+00	AS031d
36	-0.5580	-0.558	0.785	-.801	0.618	0.300	0.480	0.74E+00	-.62E+00	M6D08d
	EQ1220_Indo									
1	0.8140	0.814	0.883	0.922	0.000	0.370	0.340	0.27E+00	0.39E-01	AnO08d
2	0.7910	0.791	0.859	0.921	0.000	0.340	0.310	0.26E+00	0.55E-01	AnF08d
3	-0.7850	-0.785	0.792	-.937	0.888	0.330	0.300	0.28E+00	0.43E-02	MGR08d
4	0.7820	0.782	0.845	0.925	0.000	0.310	0.310	0.27E+00	-.27E-01	AO202d
5	0.7770	0.777	0.850	0.915	0.000	0.360	0.320	0.28E+00	0.65E-01	AF23pd
6	0.7640	0.764	0.835	0.917	0.831	0.350	0.310	0.30E+00	0.74E-01	AO302d
7	-0.7570	-0.757	0.843	-.898	0.000	0.290	0.330	0.31E+00	-.17E+00	AQF08d
8	0.7380	0.738	0.811	0.910	0.000	0.390	0.330	0.29E+00	0.11E+00	A4O08d
9	-0.7380	-0.738	0.793	-.914	0.822	0.290	0.310	0.29E+00	-.91E-01	AVH08d
10	-0.7370	-0.737	0.853	-.864	0.000	0.250	0.310	0.32E+00	-.22E+00	Mid08d
11	-0.7310	-0.731	0.760	-.918	0.835	0.310	0.300	0.26E+00	-.12E-01	MOC6xd

12	0.7300	0.730	0.790	0.907	0.819	0.350	0.310	0.31E+00	0.73E-01	PO030d
13	**-0.7220**	**-0.722**	**0.836**	**-.864**	**0.000**	**0.270**	**0.310**	**0.32E+00**	**-.16E+00**	**AnS08d**
14	-0.7200	-0.720	0.834	-.864	0.000	0.270	0.310	0.32E+00	-.17E+00	AS043d
15	**0.7180**	**0.718**	**0.788**	**0.900**	**0.809**	**0.360**	**0.310**	**0.30E+00**	**0.12E+00**	**MO61xd**
16	-0.7140	-0.714	0.850	-.840	0.000	0.250	0.310	0.39E+00	-.25E+00	AS042d
17	0.7110	0.711	0.781	0.912	0.778	0.340	0.310	0.31E+00	0.28E-01	MOC5Td
18	-0.7080	-0.708	0.810	-.875	0.000	0.270	0.310	0.35E+00	-.17E+00	AS041d
19	0.7050	0.705	0.754	0.899	0.816	0.390	0.340	0.34E+00	0.82E-01	MA021d
20	-0.7050	-0.705	0.800	-.881	0.000	0.270	0.310	0.34E+00	-.17E+00	MIS22d
21	**0.7040**	**0.704**	**0.728**	**0.900**	**0.842**	**0.360**	**0.300**	**0.41E+00**	**0.38E-01**	**M4B08d**
22	-0.7030	-0.703	0.834	-.908	0.718	0.330	0.320	0.29E+00	0.32E-04	A7E08d
23	-0.6930	-0.693	0.825	-.889	0.738	0.310	0.320	0.30E+00	-.36E-01	ATE08d
24	-0.6890	-0.689	0.758	-.875	0.818	0.270	0.300	0.36E+00	-.14E+00	SW002d
25	0.6860	0.686	0.746	0.880	0.817	0.350	0.310	0.34E+00	0.83E-01	ME082d
26	0.6680	0.668	0.800	0.900	0.688	0.370	0.320	0.35E+00	0.83E-01	AF142d
27	-0.6470	-0.647	0.718	-.901	0.000	0.300	0.310	0.36E+00	-.12E+00	PMD08d
28	-0.6220	-0.622	0.735	-.819	0.786	0.310	0.330	0.46E+00	-.99E-01	MB011d
29	0.6160	0.616	0.741	0.861	0.691	0.360	0.300	0.44E+00	0.78E-01	M2B08d
30	-0.5990	-0.599	0.776	-.836	0.660	0.290	0.320	0.43E+00	-.20E+00	AS040d
31	0.5960	0.596	0.724	0.861	0.663	0.340	0.310	0.56E+00	-.61E-01	M3B08d
32	-0.5840	-0.584	0.784	-.745	0.000	0.180	0.300	0.69E+00	-.60E+00	AS031d
33	-0.4710	-0.471	0.535	-.830	0.602	0.230	0.330	0.96E+00	-.57E+00	M4D08d
34	**-0.4380**	**-0.438**	**0.614**	**-.714**	**0.000**	**0.078**	**0.270**	**0.13E+01**	**-.12E+01**	**M6D08d**
	SH2047_Amer									
1	0.7270	0.727	0.872	0.833	0.000	0.320	0.240	0.30E+00	0.22E+00	ME082d
2	**-0.7160**	**-0.716**	**0.785**	**-.912**	**0.000**	**0.230**	**0.240**	**0.33E+00**	**-.93E-01**	**M4B08d**
3	-0.7130	-0.713	0.738	-.902	0.848	0.270	0.290	0.43E+00	-.21E+00	MOC5Td
4	0.7060	0.706	0.820	0.861	0.000	0.330	0.250	0.41E+00	0.21E+00	MGR08d
5	-0.6820	-0.682	0.767	-.889	0.000	0.300	0.270	0.35E+00	-.42E-02	AVH08d
6	-0.6790	-0.679	0.765	-.887	0.000	0.210	0.250	0.39E+00	-.16E+00	MB011d
7	-0.6670	-0.667	0.815	-.818	0.000	0.130	0.240	0.70E+00	-.67E+00	M2B08d
8	-0.6510	-0.651	0.797	-.816	0.000	0.120	0.240	0.71E+00	-.67E+00	M3B08d
9	-0.6490	-0.649	0.820	-.792	0.000	0.200	0.280	0.54E+00	-.43E+00	MOC6xd
10	-0.6470	-0.647	0.792	-.817	0.000	0.094	0.240	0.87E+00	-.87E+00	A4O08d
11	**-0.6400**	**-0.640**	**0.775**	**-.818**	**0.789**	**0.230**	**0.290**	**0.48E+00**	**-.36E+00**	**MO61xd**
12	-0.5840	-0.584	0.740	-.789	0.000	0.150	0.260	0.95E+00	-.72E+00	PMD08d
13	-0.5500	-0.550	0.735	-.749	0.000	0.150	0.270	0.70E+00	-.61E+00	SW002d
14	-0.5320	-0.532	0.732	-.727	0.000	0.100	0.240	0.10E+01	-.91E+00	M4D08d
15	**-0.4490**	**-0.449**	**0.581**	**-.772**	**0.000**	**0.140**	**0.240**	**0.60E+00**	**-.55E+00**	**AnF08d**
16	-0.4210	-0.421	0.551	-.763	0.000	0.120	0.240	0.71E+00	-.64E+00	AF23pd
17	-0.3230	-0.323	0.392	-.824	0.000	0.170	0.230	0.56E+00	-.28E+00	A7E08d
	SH2047_Afri									
1	**-0.6010**	**-0.601**	**0.769**	**-.781**	**0.000**	**0.260**	**0.460**	**0.57E+00**	**-.53E+00**	**MO61xd**

***AOD** (AOD > 0.2) **regional scores** (green better - red worse)*

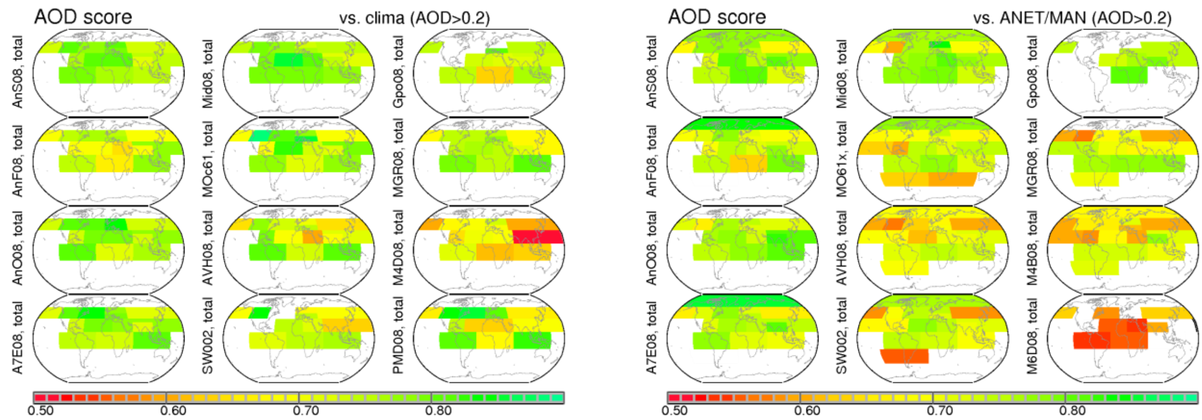

***Figure 9.5** regional AOD scores (for AOD>0.2 reference data) for most recent retrievals of ATSR (left colum), of NASA retrievals (center column) and of MERIS (and –like) retrievals (right column) against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

***AOD** (AOD >0.2)* ***- regional ATSR scores** (green better - red worse)*

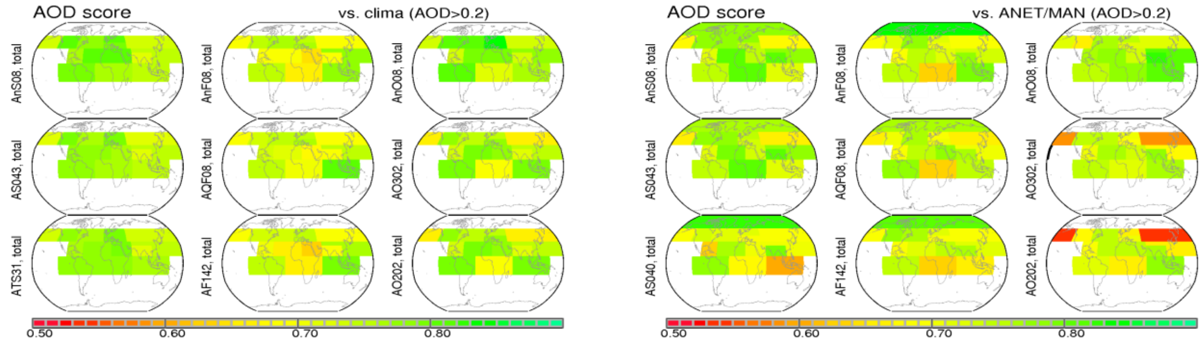

Figure 9.6 *regional AOD scores (for AOD>0.2 reference data) for most recent retrievals of ATSR SU /FI /OX (top row) to older versions (lower rows colum) against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

The Figures 9.5 and 9.6 above compare regional combination scores of most recent AOD retrievals at AOD >0.2 and of the three ATSR current AOD retrievals [at AOD >0.2] to those of older versions. In addition, Figure 9.7 below compares regional errors (associated with AOD [at AOD >0.2] retrieval sub-scores) for the most recent ATSR retrievals. Hereby, stronger colors indicate a larger error. For the bias sub-score a blue color illustrates a regional AOD underestimate and a red color a regional AOD overestimate (for larger AOD).

***AOD** (AOD >0.2)* ***- regional ATSR errror and bias** (blue negative - red positive)*

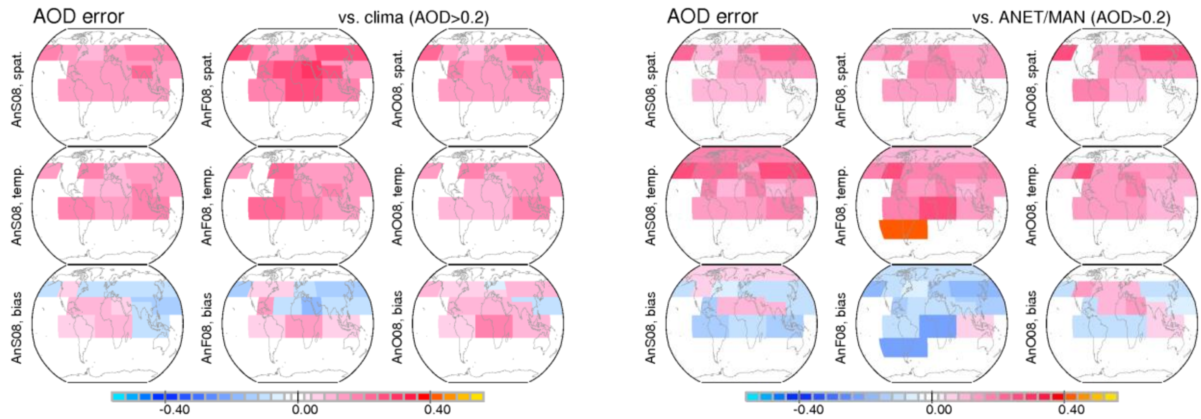

Figure 9.7 *regional AOD (>0.2 case) errors (in red) for spatial correlation (top row) temporal correlation (center row) and bias (bottom row, blue indicates a negative sign) for the most recent retrievals of ATSR SU /FI /OX against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AODf scoring

***all AODf** – ranking **global** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.6490	0.649	0.781	0.831	0.753	0.077	0.068	0.52E+00	0.18E+00	AQF08m
2	0.6470	0.647	0.800	0.809	0.767	0.047	0.053	0.60E+00	0.20E+00	AVH08m
3	0.6400	0.640	0.794	0.806	0.813	0.110	0.093	0.51E+00	0.31E+00	Gpo08m

4	0.6370	0.637	0.779	0.817	0.740	0.082	0.068	0.55E+00	0.26E+00	AF23pm
5	**0.6330**	**0.633**	**0.779**	**0.812**	**0.729**	**0.079**	**0.068**	**0.54E+00**	**0.27E+00**	**AnF08m**
6	0.6230	0.623	0.792	0.787	0.786	0.083	0.062	0.57E+00	0.45E+00	AS043m
7	**0.6210**	**0.621**	**0.766**	**0.811**	**0.752**	**0.055**	**0.060**	**0.52E+00**	**0.14E+00**	**Mid08m**
8	**0.6050**	**0.605**	**0.784**	**0.772**	**0.775**	**0.087**	**0.062**	**0.63E+00**	**0.53E+00**	**AnS08m**
9	**0.5690**	**0.569**	**0.798**	**0.713**	**0.696**	**0.081**	**0.059**	**0.80E+00**	**0.53E+00**	**MOc61m**
10	0.5500	0.550	0.754	0.729	0.669	0.100	0.060	0.85E+00	0.73E+00	A4O08m
11	**0.5090**	**0.509**	**0.701**	**0.726**	**0.671**	**0.120**	**0.060**	**0.87E+00**	**0.79E+00**	**AnO08m**
12	0.4990	0.499	0.701	0.713	0.627	0.100	0.059	0.84E+00	0.69E+00	AO302m

***all AODf** – ranking **global** scores based on matches of daily 1x1 deg averages with AERONET/MAN*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	**0.6530**	**0.653**	**0.798**	**0.818**	**0.802**	**0.085**	**0.110**	**0.71E+00**	**0.15E+00**	**Mid08d**
2	**0.6450**	**0.645**	**0.794**	**0.811**	**0.781**	**0.140**	**0.100**	**0.68E+00**	**0.50E+00**	**MO61xd**
3	0.6430	0.643	0.761	0.844	0.782	0.140	0.120	0.61E+00	0.33E+00	AS043d
4	0.6410	0.641	0.804	0.797	0.762	0.190	0.140	0.68E+00	0.53E+00	AMS08d
5	**0.6340**	**0.634**	**0.760**	**0.834**	**0.766**	**0.140**	**0.120**	**0.62E+00**	**0.36E+00**	**AnS08d**
6	0.6310	0.631	0.761	0.829	0.765	0.130	0.130	0.72E+00	0.13E+00	AF23pd
7	0.6200	0.620	0.748	0.829	0.758	0.120	0.120	0.73E+00	0.12E+00	AQF08d
8	**0.6130**	**0.613**	**0.740**	**0.828**	**0.753**	**0.110**	**0.120**	**0.73E+00**	**0.90E-01**	**AnF08d**
9	0.6080	0.608	0.743	0.817	0.713	0.110	0.100	0.72E+00	0.21E+00	AO302d
10	0.5800	0.580	0.741	0.782	0.730	0.110	0.110	0.82E+00	0.39E+00	A4O08d
11	**0.5540**	**0.554**	**0.712**	**0.778**	**0.744**	**0.140**	**0.100**	**0.86E+00**	**0.59E+00**	**AnO08d**
12	0.5280	0.528	0.650	0.811	0.728	0.060	0.096	0.75E+00	-.60E-01	AVH08d
13	**0.5200**	**0.520**	**0.684**	**0.760**	**0.697**	**0.160**	**0.120**	**0.95E+00**	**0.41E+00**	**M5B08d**
14	**0.4790**	**0.479**	**0.608**	**0.788**	**0.620**	**0.140**	**0.120**	**0.11E+01**	**-.24E-01**	**M6D08d**

The Figure 9.8 below compares the regional combination scores of most recent AODf retrievals. In addition, in Figure 9.9 the regional errors (associated with the AODf retrieval sub-scores) for the most recent ATSR retrievals are compared. Hereby, stronger colors mean a larger error. For the bias sub-score a blue color indicates a regional AODf underestimate and a red color indicates a regional AODf overestimate.

***AODf - regional scores** (green better - red worse)*

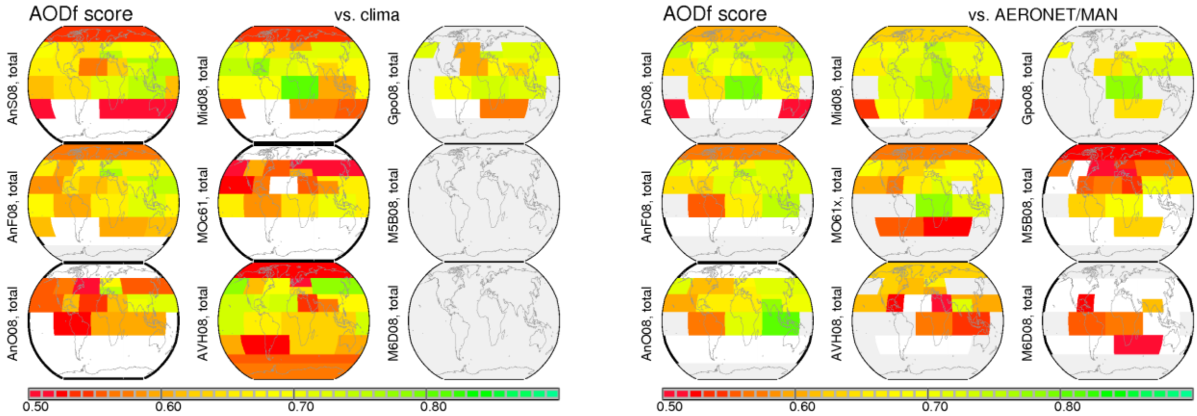

***Figure 9.8** regional AODf scores for most recent retrievals of ATSR (left colum), of NASA retrievals (center column) and of other retrievals (right column) against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AODf - regional ATSR errror and bias *(blue negative - red positive)*

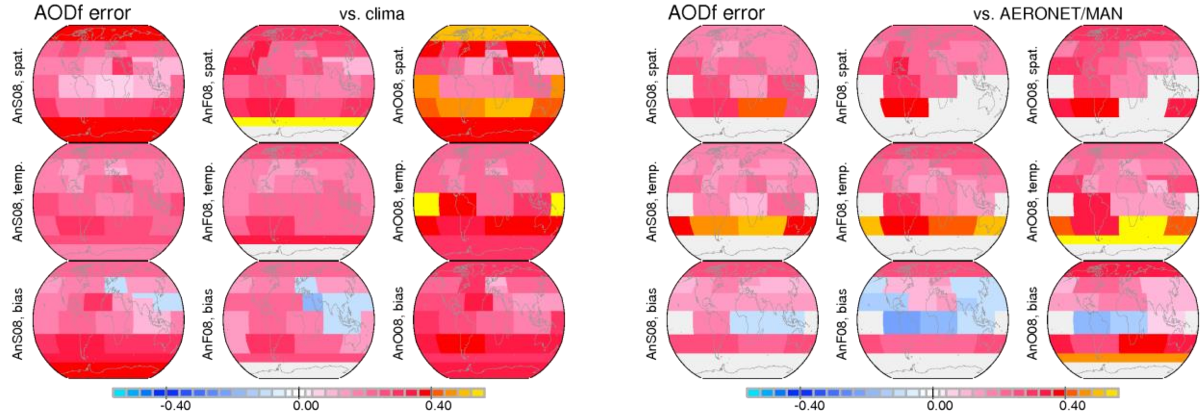

Figure 9.9 *regional AODf errors (in red) for spatial correlation (top row) temporal correlation (center row) and bias (bottom row, blue indicates a negative sign) for the most recent retrievals of ATSR SU /FI /OX against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AODf (AOD > 0.2) **scoring**

AODf *(AOD>0.2) – ranking **global** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.7120	0.712	0.841	0.846	0.837	0.190	0.170	0.40E+00	0.99E-01	Gpo08m
2	0.6630	0.663	0.782	0.849	0.797	0.200	0.180	0.43E+00	0.13E+00	AS043m
3	**0.6630**	**0.663**	**0.777**	**0.854**	**0.798**	**0.210**	**0.180**	**0.44E+00**	**0.16E+00**	**AnS08m**
4	**-0.6580**	**-0.658**	**0.796**	**-.826**	**0.745**	**0.140**	**0.180**	**0.58E+00**	**-.32E+00**	**MOc61m**
5	**-0.6490**	**-0.649**	**0.773**	**-.840**	**0.819**	**0.130**	**0.180**	**0.46E+00**	**-.25E+00**	**Mid08m**
6	**0.6430**	**0.643**	**0.769**	**0.835**	**0.795**	**0.230**	**0.180**	**0.45E+00**	**0.26E+00**	**AnO08m**
7	-0.6390	-0.639	0.751	-.851	0.785	0.190	0.190	0.45E+00	0.35E-02	AF23pm
8	**-0.6300**	**-0.630**	**0.745**	**-.845**	**0.777**	**0.180**	**0.190**	**0.47E+00**	**-.41E-01**	**AnF08m**
9	-0.6230	-0.623	0.739	-.843	0.792	0.180	0.190	0.45E+00	-.16E-01	AQF08m
10	-0.6130	-0.613	0.797	-.769	0.817	0.087	0.180	0.76E+00	-.72E+00	AVH08m
11	0.6120	0.612	0.731	0.837	0.755	0.210	0.180	0.48E+00	0.14E+00	A4008m
12	0.6120	0.612	0.738	0.829	0.746	0.200	0.180	0.48E+00	0.12E+00	AO302m

AODf *(AOD >0.2) – ranking **global** scores based on matches of daily 1x1 deg avgs with AERONET*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	-0.7050	-0.705	0.795	-.886	0.000	0.270	0.270	0.38E+00	-.34E-01	AS043d
2	**-0.7040**	**-0.704**	**0.797**	**-.884**	**0.000**	**0.280**	**0.280**	**0.39E+00**	**-.11E-01**	**AnS08d**
3	**-0.7000**	**-0.700**	**0.817**	**-.856**	**0.000**	**0.260**	**0.270**	**0.46E+00**	**-.62E-01**	**AnO08d**
4	-0.6740	-0.674	0.783	-.861	0.000	0.250	0.300	0.48E+00	-.21E+00	AQF08d
5	**0.6710**	**0.671**	**0.756**	**0.888**	**0.846**	**0.260**	**0.240**	**0.39E+00**	**0.42E-01**	**MOc61d**
6	-0.6620	-0.662	0.779	-.851	0.000	0.250	0.290	0.53E+00	-.27E+00	AF23pd
7	**-0.6620**	**-0.662**	**0.805**	**-.822**	**0.000**	**0.190**	**0.290**	**0.50E+00**	**-.37E+00**	**Mid08d**
8	-0.6580	-0.658	0.785	-.837	0.000	0.230	0.270	0.55E+00	-.25E+00	A4008d
9	**-0.6470**	**-0.647**	**0.771**	**-.840**	**0.000**	**0.220**	**0.280**	**0.56E+00**	**-.34E+00**	**AnF08d**
10	-0.6190	-0.619	0.730	-.848	0.773	0.220	0.240	0.54E+00	-.17E+00	AO302d
11	-0.4930	-0.493	0.676	-.730	0.818	0.090	0.230	0.10E+01	-.94E+00	AVH08d
12	**-0.4890**	**-0.489**	**0.629**	**-.778**	**0.000**	**0.220**	**0.290**	**0.96E+00**	**-.49E+00**	**M6D08d**
13	-0.3940	-0.394	0.561	-.703	0.000	0.092	0.310	0.10E+01	-.94E+00	MED08d

***AODf** (AOD >0.2) - **regional scores** (green better - red worse)*

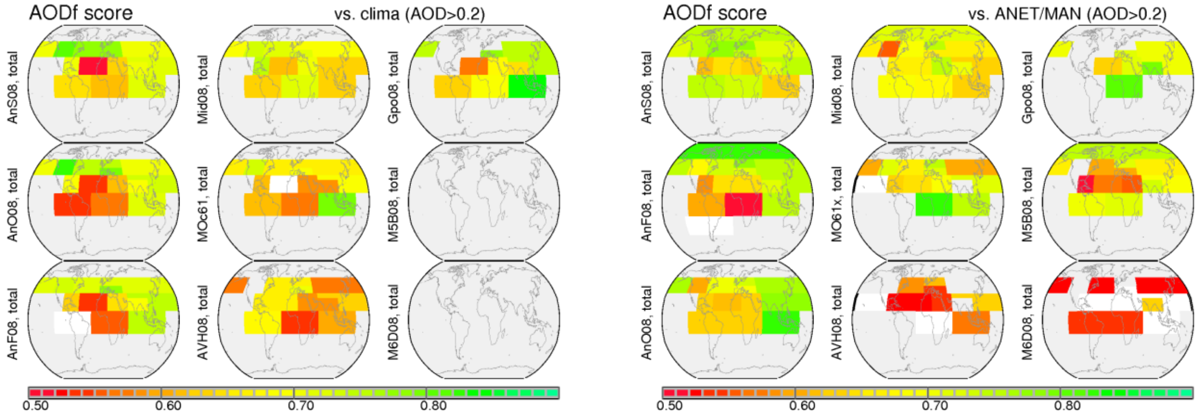

Figure 9.10 *regional AODf scores (or AOD >0.2 reference cases) for most recent retrievals of ATSR (left colum), of NASA retrievals (center column) and of other retrievals (right column) against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

***AODf** (AOD >0.2) - **regional ATSR errror and bias** (blue negative - red positive)*

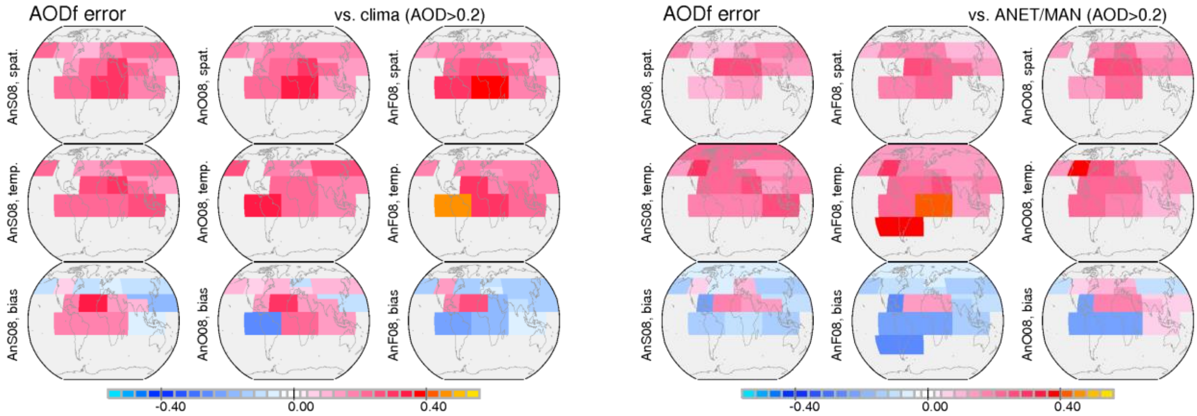

Figure 9.11 *regional AODf (>0.2 case) errors (in red) for spatial correlation (top row) temporal correlation (center row) and bias (bottom row, blue indicates a negative sign) for the most recent retrievals of ATSR SU /FI /OX against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AODc scoring

***all AODc** – ranking **global** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
14	ranked,	score,	seaso,	bias,	corr,	ce1,	ce2,	rerr,	rbia	rall_yg_scor
1	-0.7210	-0.721	0.822	-.877	0.779	0.054	0.056	0.36E+00	-.76E-01	AS043m
2	**-0.7010**	**-0.701**	**0.815**	**-.860**	**0.763**	**0.050**	**0.056**	**0.39E+00**	**-.13E+00**	**AnS08m**
3	0.6520	0.652	0.780	0.836	0.736	0.068	0.057	0.44E+00	0.27E+00	A4O08m
4	**0.6410**	**0.641**	**0.807**	**0.795**	**0.734**	**0.093**	**0.056**	**0.55E+00**	**0.47E+00**	**MOc61m**
5	**0.6300**	**0.630**	**0.785**	**0.803**	**0.759**	**0.082**	**0.057**	**0.49E+00**	**0.38E+00**	**Mid08m**
6	0.5990	0.599	0.746	0.804	0.719	0.082	0.056	0.53E+00	0.29E+00	AVH08m
7	0.5860	0.586	0.789	0.742	0.782	0.140	0.083	0.67E+00	0.60E+00	Gpo08m
8	-0.5850	-0.585	0.716	-.818	0.649	0.053	0.057	0.56E+00	-.12E+00	AO302m

9	0.5840	0.584	0.740	0.789	0.723	0.078	0.053	0.63E+00	0.36E+00	AnF08m
10	-0.5800	-0.580	0.735	-.790	0.650	0.052	0.056	0.62E+00	-.18E+00	AnO08m
11	0.5660	0.566	0.745	0.760	0.741	0.074	0.053	0.71E+00	0.23E+00	AF23pm

all AODc *– ranking* ***global*** *scores based on matches of daily 1x1 deg averages with AERONET/MAN*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.5580	0.558	0.682	0.818	0.724	0.080	0.064	0.65E+00	0.32E+00	Mid08d
2	0.5510	0.551	0.660	0.835	0.685	0.082	0.063	0.68E+00	0.21E+00	MOc61d
3	0.5410	0.541	0.665	0.813	0.681	0.063	0.061	0.75E+00	0.57E-01	AS043d
4	0.5300	0.530	0.653	0.811	0.689	0.061	0.061	0.77E+00	0.38E-01	AnS08d
5	0.5270	0.527	0.666	0.790	0.674	0.080	0.059	0.91E+00	0.23E+00	AnO08d
6	0.5270	0.527	0.655	0.804	0.709	0.093	0.056	0.70E+00	0.45E+00	AVH08d
7	0.5240	0.524	0.643	0.815	0.667	0.060	0.058	0.84E+00	-.36E-01	AO302d
8	0.5210	0.521	0.643	0.811	0.659	0.067	0.060	0.73E+00	0.28E+00	A4O08d
9	0.4620	0.462	0.585	0.791	0.629	0.066	0.055	0.85E+00	0.18E+00	AnF08d
10	-0.4490	-0.449	0.587	-.763	0.623	0.054	0.059	0.99E+00	-.17E+00	AF23pd
11	-0.4440	-0.444	0.567	-.782	0.633	0.061	0.055	0.83E+00	0.39E-01	M5B08d
12	0.4260	0.426	0.591	0.721	0.000	0.230	0.083	0.12E+01	0.80E+00	MED08d
13	-0.3880	-0.388	0.551	-.704	0.579	0.017	0.068	0.14E+01	-.10E+01	M6D08d

The Figure 9.12 [9.14] compares regional combination scores of most recent AODc [at larger AOD only] retrievals. In addition, in Figure 9.13 [9.15] regional errors (associated with the AODc retrieval sub-scores) for the most recent ATSR retrievals are compared. Hereby, stronger colors mean a larger error. For the bias sub-score a blue color indicates a regional AODc underestimate and a red color indicates a regional AODc overestimate.

AODc - regional scores *(green better - red worse)*

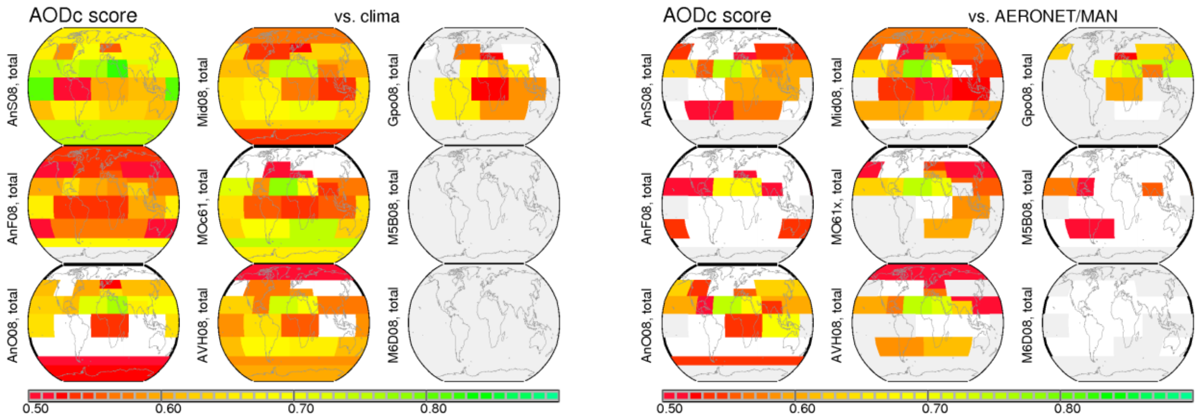

Figure 9.12 *regional AODc scores for most recent retrievals of ATSR (left colum), of NASA retrievals (center column) and of other retrievals (right column) against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AODc - regional ATSR errror and bias *(blue negative - red positive)*

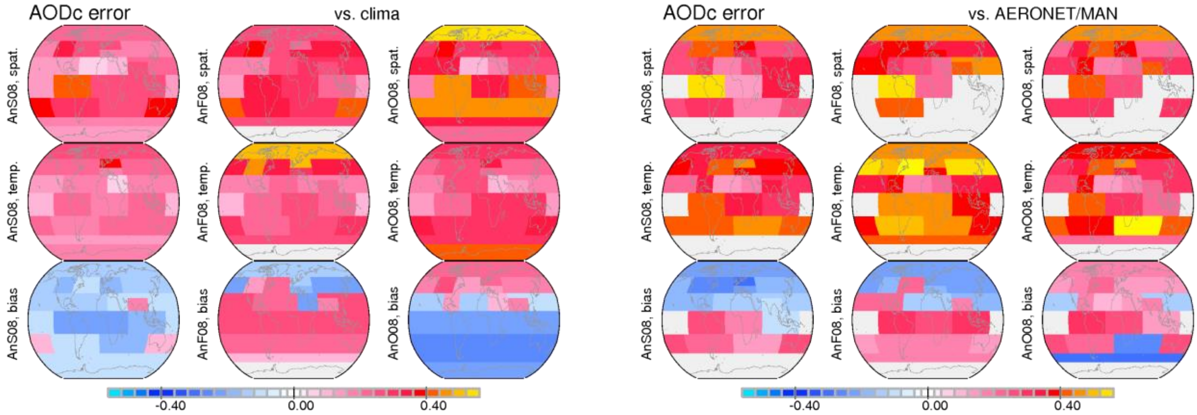

Figure 9.13 *regional AODc errors (in red) for spatial correlation (top row) temporal correlation (center row) and bias (bottom row, blue indicates a negative sign) for the most recent retrievals of ATSR SU /FI /OX against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

AODc(AOD > 0.2) scoring

AODc *(AOD>0.2) – ranking **global** scores based on monthly 1x1 deg matches with MACv2_08*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.7040	0.704	0.826	0.852	0.690	0.120	0.120	0.49E+00	0.98E-01	AnO08m
2	-0.6780	-0.678	0.826	-.821	0.768	0.100	0.110	0.52E+00	-.19E+00	AS043m
3	-0.6670	-0.667	0.820	-.814	0.747	0.093	0.120	0.55E+00	-.22E+00	AnS08m
4	0.6650	0.665	0.806	0.825	0.720	0.120	0.120	0.50E+00	0.14E+00	A4O08m
5	0.6640	0.664	0.840	0.790	0.743	0.170	0.120	0.56E+00	0.44E+00	Mid08m
6	-0.6600	-0.660	0.788	-.837	0.701	0.100	0.120	0.50E+00	-.79E-01	AO302m
7	0.6560	0.656	0.847	0.775	0.739	0.240	0.150	0.58E+00	0.45E+00	Gpo08m
8	0.6430	0.643	0.843	0.762	0.765	0.200	0.110	0.69E+00	0.63E+00	AVH08m
9	0.6390	0.639	0.828	0.772	0.675	0.200	0.120	0.67E+00	0.61E+00	MOc61m
10	0.6050	0.605	0.773	0.783	0.684	0.110	0.110	0.64E+00	0.35E-01	AnF08m
11	0.5830	0.583	0.759	0.768	0.698	0.094	0.110	0.70E+00	-.18E+00	AF23pm

AODc *(AOD >0.2) – ranking **global** scores based on matches of daily 1x1 deg avgs with AERONET*

rank	score	combo	temp	bias	spatial	D,med	R,med	rel. error	rel bias	data-set
1	0.5630	0.563	0.692	0.813	0.697	0.140	0.110	0.73E+00	0.40E+00	MOc61d
2	-0.5610	-0.561	0.688	-.816	0.678	0.100	0.110	0.88E+00	-.10E+00	AO302d
3	0.5500	0.550	0.688	0.799	0.000	0.130	0.120	0.84E+00	0.29E+00	AnO08d
4	0.5390	0.539	0.643	0.839	0.000	0.093	0.100	0.83E+00	0.22E-01	AS043d
5	0.5390	0.539	0.692	0.779	0.000	0.150	0.120	0.75E+00	0.49E+00	Mid08d
6	-0.5370	-0.537	0.643	-.834	0.000	0.090	0.100	0.84E+00	0.11E-01	AnS08d
7	-0.5290	-0.529	0.656	-.806	0.000	0.100	0.100	0.83E+00	0.20E+00	A4O08d
8	0.4980	0.498	0.680	0.731	0.718	0.200	0.110	0.88E+00	0.76E+00	AVH08d
9	0.4670	0.467	0.592	0.790	0.000	0.092	0.091	0.96E+00	0.13E+00	AnF08d
10	-0.4530	-0.453	0.594	-.763	0.000	0.070	0.092	0.11E+01	-.30E+00	ATF08d

***AODc** (AOD >0.2) **-** **regional** **scores** (green better - red worse)*

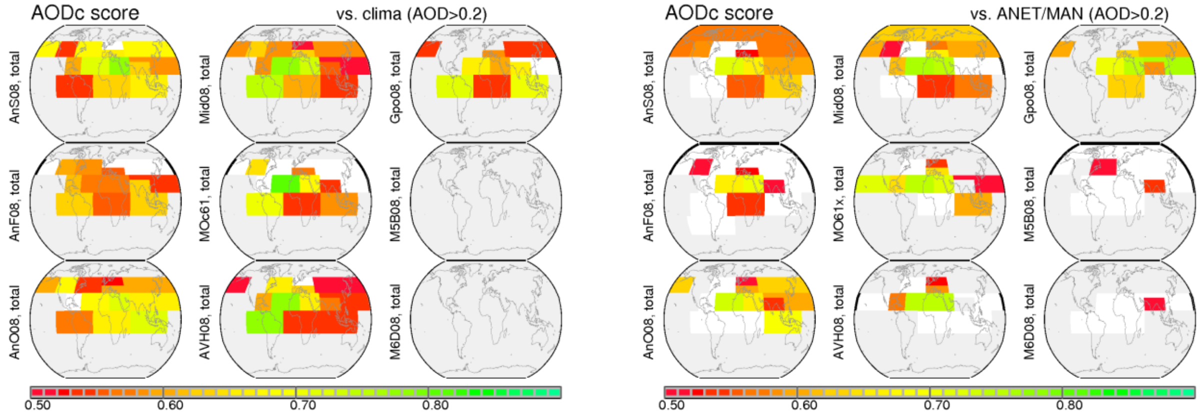

***Figure 9.14** regional AODc scores (or AOD >0.2 reference cases) for most recent retrievals of ATSR (left colum), of NASA retrievals (center column) and of other retrievals (right column) against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

***AODf** (AOD >0.2) **-** **regional** **ATSR errror and bias** (blue negative - red positive)*

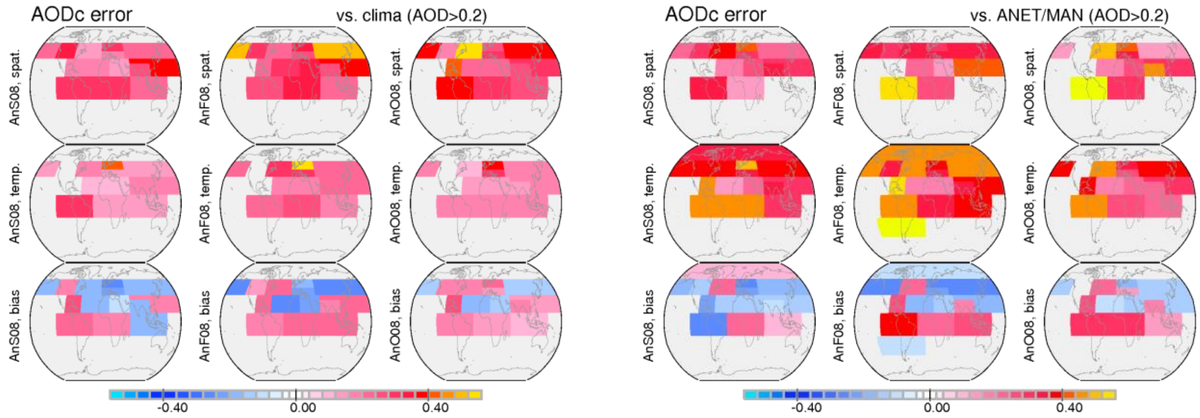

***Figure 9.15** regional AODc (>0.2 case) errors (in red) for spatial correlation (top row) temporal correlation (center row) and bias (bottom row, blue indicates a negative sign) for the most recent retrievals of ATSR SU /FI /OX against MACv2 monthly averages (left block) and against AERONET daily averages (right)*

In summary, among the three ATSR AOD retrievals the Swansea retrieval is still overall the best performer. However, for higher AOD retrievals the performance drops below that of ATSR-OX, as illustrated in Table 9.2. There are also scores of the recent MISR and MODIS retrievals listed. While MISR continues to remains a top-performer (now also over oceans), the most recent MODIS retrieval disappoints, with lower scores than the previous version. The MERIS scores (here the XBEAR 2.2 with data for the entire year 2008) consistently remain below scores for ATSR, MISR or MODIS.

Table 9.2 *comparison of global, oceanic and land combination scores against MACv2_08 (the closer the scores to 1.0 - the better the performance)*

AOD	**AOD**			**AOD >0.2**		
vs MACv2_08	*global*	*ocean*	*land*	*global*	*ocean*	*land*
ATSR **SU v4.32**	**.744**	**.748**	**.769**	.774	.762	.780
ATSR **FI v3.11**	.655	.643	.687	.742	.762	.733
ATSR **OX v4.10**	.643	.616	.716	.780	.766	**.785**
ME-**XBAER v2.2**	.637	.615	.681	.754	.744	.758
MISR v32	.709	.711	.759	**.787**	**.794**	.784
MODIS c61	.645	.665	.670	.775	.792	.767

Table 9.3 *comparison of global combination scores for AOD, AODf (fine-mode) and AODc (coarse-mode) against MACv2_08 (the closer the scores to 1.0 - the better the performance)*

global	**AOD**			**AOD >0.2**		
vs MACv2_08	*AOD*	*AODf*	*AODc*	*AOD*	*AODf*	*AODc*
ATSR **SU v4.32**	**.744**	.605	**.701**	.774	**.663**	.667
ATSR **FI v3.11**	.655	**.633**	.584	.742	.630	.605
ATSR **OX v4.10**	.643	.509	.580	.780	.643	**.704**
MISR v32	.709	.621	.641	**.787**	.649	.664
MODIS c61	.645	.569	.630	.775	.658	.639

10 SUMMARY

main points of the seasonal difference plots to MACv2_08 and MISR

ATSR-SU: the current version is improved over previous versions as especially the AOD overestimates over N. Africa are reduced but still exist as do AOD overestimates over regions with strong absorption

AODf overestimates
- over biomass burning regions, over oceans - especially for dust outflow regions

AODc overestimates
- mid-year over Australia

AODc underestimates
- dust outflow over oceans

AAOD underestimates
- almost everywhere

Improvement potential: stronger fine-mode absorption, larger dust sizes near source regions

ATSR-FI: the current version resembles an older version without an applied quality filter

AODf underestimates
- biomass burning regions

AODc overestimates
- biomass burning regions, over mid-latitude oceans (likely cloud contamination)

AODc underestimates
- coarse mode dominated regions especially dust outflow over oceans

Improvement potential: apply quality filter, revisit mode absorption / size assumptions

ATSR-OX: the current version is improved over the previous version. Although biases resembles actually an older version, the skill at AOD events is sharply improved

AODf overestimates
- fine-mode over oceans, especially near outflow regions

AODc overestimates
- biomass regions, mid-year over Australia

AODc underestimates
- dust outflow over oceans

Improvement potential: revisit absorption/size assumptions for modes (dust over oceans)

MERIS- XBAER: the current version is continuously improved over previous versions

AODf underestimates
- over coastal oceans (e.g. off west Africa, off India)

AODc overestimates
- mid-latitude oceans (likely cloud contamination) , coastal AOD

AODc underestimates
- northern Africa

Improvement potential: fine-mode aerosol mode over oceans

MERIS- DLR: the current version is still in the developing phase with many larger biases

AODf overestimates
- over continents, especially dust source regions

AODf underestimates
- over costal oceans (e.g. off west Africa, off India)

AODc underestimates
- over continents, even missing over oceans

Improvement potential: coarse-mode aerosol model

main points of the ATSR retrieval comparisons over China

ATSR-SU (best coverage over the Qinghai-Tibetan Plateau with arid or semi-arid land cover)
- overall best performing ATSR retrieval (highest correlation coefficient R at 0.871) - even capturing at times extremely low AOD values over the Qinghai-Tibetan Plateau
- overall AOD underestimates (NMB at 0.81)
- most estimated uncertainties below 0.1 (even though real biases are larger)

ATSR-FI (smallest coverage and number of matchups - most coverage over eastern China)
- uncertainty increases strongest with AOD increase
- overall strong AOD underestimates (NMB at 0.72)
- estimated uncertainties at times very large, overestimates are rare

ATSR-OX (best overall coverage but less coverage over arid or semi-arid western China)
- overall weak AOD underestimates (NMB at 0.92)
- most estimated uncertainties below 0.1 (although estimated biases are larger)
- apparent quality by retrieved uncertainty

main points of the monthly statistics comparisons to AERONET data

AOD retrievals
- Among the current three ATSR retrievals ATSR-SU (Swansea) has the highest correlation (R=.868) and the lowest Root Mean Square error (RMS=0.94). Still, the MODIS C6.1 correlation (R=.892) is higher.
- Among the current MERIS retrievals, MERIS-XBEAR 2.3 has the highest correlation (R=.732) and the MERIS-GRASP has the lowest Root Mean Square error (RMS=1.35). Still the skill of all MERIS retrievals remains way below those for retrievals by MODIS, MISR and ATSR.

AODf retrievals

- Among the current three ATSR retrievals ATSR-FI (Finland) has the highest correlation (R=.849) and shares with ATSR-SU (Swansea) the lowest Root Mean Square error (RMSE=0.83).

temporal improvement

- ATSR-SU, ATSR-OX and MERIS-XBEAR show retrieval improvements over time
- ATSR-FI also would have shown improvement over time, if quality selections would have been applied

main points of the regional scoring to MACv2_08 and AERONET data

- among the three ATSR AOD retrievals the Swansea retrieval is still overall the best
- for higher AOD retrievals the performance drops below that of ATSR-OX
- MERIS scores (here the XBEAR 2.2 with data for the entire year 2008) consistently remain below scores for ATSR, MISR or MODIS

End of the document