AERONET: New Aerosol products, data access, and reanalysis of data for mixtures of fine and coarse mode aerosols

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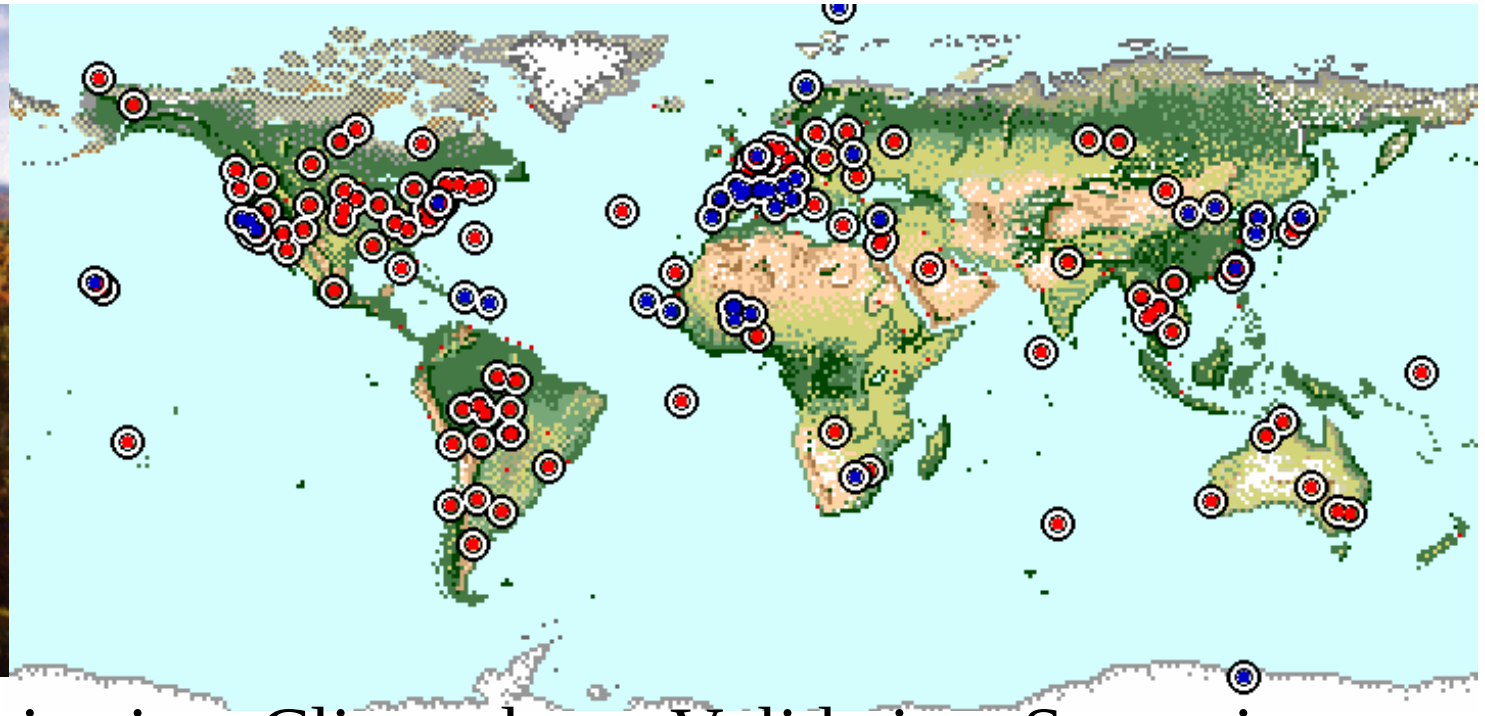
AERONET-**An Internationally Federated Network**



- Characterization, Climatology, Validation, Synergism
- Near real-time acquisition; ~Decade of measurements
- ~155 permanent sites in 2002
- Homepage access http://aeronet.gsfc.nasa.gov
- What's New?

New Developments from the AERONET Program

- New Instrumentation supported
- Synergism with ancillary observations supported
- Spheroid Inversion
- Quality Assured Inversion Products
- AOD climatology

Instrumentation-Significant Developments

- Standard 340-1020 nm: 8λ AOT, 4λ Almuc
- Polar 440-1020 nm: 4λ AOT, 4λ Almuc, 1λ Polar
- SeaPRISM 440-1020 nm + 413&555nm sea radiance + 4λ almuc
- Extended λ, 340–1640 nm: 9 λ AOT, 380-1640 almuc (6)

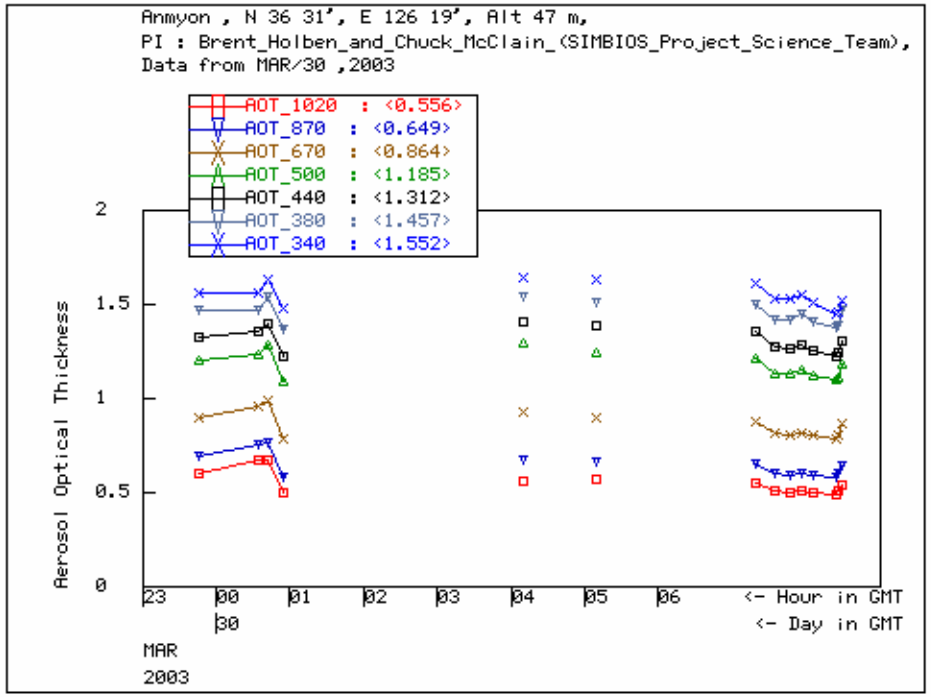
New instrumentation

- SeaPrism-ocean leaving radiances
- Platform mounted sun and ocean viewing
- 413 & 555 nm
- 15 min measurement ocean radiance obs
- 5 in network

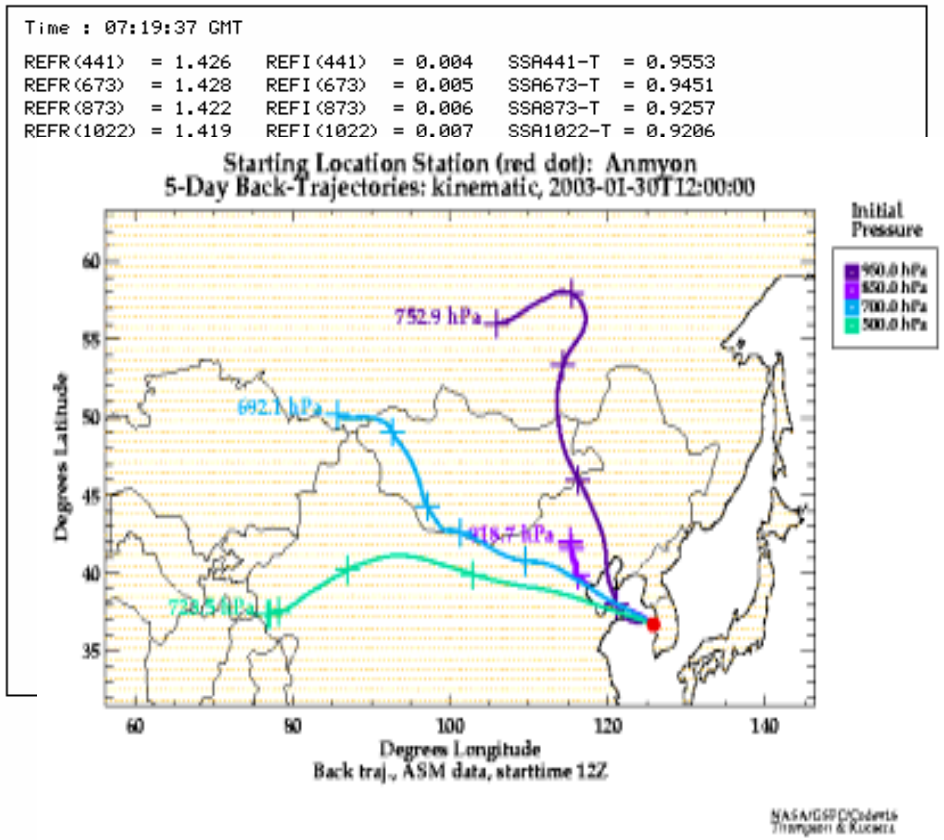
- Extended λ (1.64μm)
- Almucantars UV & NIR
- Enhance non spherical retrievals
- Initial deployments in coarse aerosol regions
- Multi almucantar retrievals to be evaluated
- ~15 in network

Ancillary Data sets-Back trajectories

Data from MAR 30 of 2003



Almucantar No 1 on MAR 30 of 2003



AERONET DOWNLOAD

- AOT Level 1.0
- AOT Level 1.5
- Almucantars
- Principal Planes
- More AERONET Downloadable Products...

Additional Lidar and Satellite data expected to become available

Quality Assured Retrievals (LEVEL 2.0)

Filters:
- τ is for Level 2
- Solar Zenith Angle $\geq 25^{o}$
- Size Distr. tails < 15% of maximum
- almucantar symmetrical at **21 angles**

Primary Data-base:
–τ Level 1.5
-All Solar Zenith angles
-10 symmetrical angles

Filter: Sky fitting error : error: 5%-15%

error: < 5%

Check for Non-sphericity

Filters:
$\tau(440) \geq 0.4$
Solar Zenith Angle $\geq 45^{o}$

Level 2 OUTPUT:

-Size distribution
(0.05 μm < r < 15μm)

- Real Part of Ref. Index
- Imaginary Part of Ref. Index
- Single Scattering Albedo
(λ= 0.44; 0.67; 0.87; 1.02 μm)

Non-Spericity Check & Spheroid Processing (2.0)

Processing almucantars as non-spherical:
(using model of randomly oriented spheroids)

Filters:
- τ is for Level 2
- Solar Zenith Angle ≥ 45º
- Size Distr. tails < 15% of maximum
- almucantar symmetrical at **21 angles**

Check for NON-SPHERICITY:
- Ångström parameter ≤ 0.6
- Solar Zenith Angle ≥ 45º
- Sky fitting error 5%-15%

Filter: Sky fitting error <10%

Filter: τ(440) ≥ 0.4

Level 2 OUTPUT:

-Size distribution
(~0.6μm ≤ r ≤ 15μm)

- Real Part of Ref. Index
(λ= 0.87; 1.02 μm)
-Imaginary Part of Ref. Index
- Single Scattering Albedo
(λ= 0.44; 0.67; 0.87; 1.02 μm)

-Size distribution
(0.05μm ≤ r ≤ 15μm)

- Real Part of Ref. Index
- Imaginary Part of Ref. Index
- Single Scattering Albedo
(λ= 0.44; 0.67; 0.87; 1.02 μm)

AERONET Data Download Tool

Click Geographic Region, Country/State or AERONET Site to change site selection:

Geographic Region	Country/State	AERONET Site
South_America	Brazil	Abracos_Hill

Download Data for Abracos_Hill

Select the start and end time of the data download period:

START:	1 JAN 1999	END:	1 JAN 2002

Data Descriptions Data Units Development Status Update Log

Note: Data are not available if the data type is *italicized*

Select the data type(s) with checkbox:

SPECIAL SPHEROID AND SPHERICAL ALMUCANTAR INTERFACE

Almucantar Retrievals

Total Only	Total/Fine/Coarse Modes
9. ☐ Size Distribution	**12.** ☐ Volume
10. ☐ Refractive Index	**13.** ☐ AOT Absorption
11. ☐ AOT Coincident	**14.** ☐ AOT Extinction
☐ Select All Retrievals	**15.** ☐ SSA
	16. ☐ Asymmetry Factor
	18. ☐ Combined Retrievals (9-16)

Almucantar Retrieval Settings (Advanced users only)

Recommended	Provisional
○ **SPHERICAL**-LEVEL 2.0 ○ **SPHEROID**-LEVEL 2.0	◉ **SPHERICAL** AND **SPHEROID** LEVEL 2.0 - *(Default Option Only)*

Data Mode

◉ Default Options ○ Advanced Options

Advanced Level 2.0 Retrieval Options

Angles (No.)	Solar Zenith Angle (Degrees)		Sky Error (%)
Min	Min	Max	Max
21	25	77	15

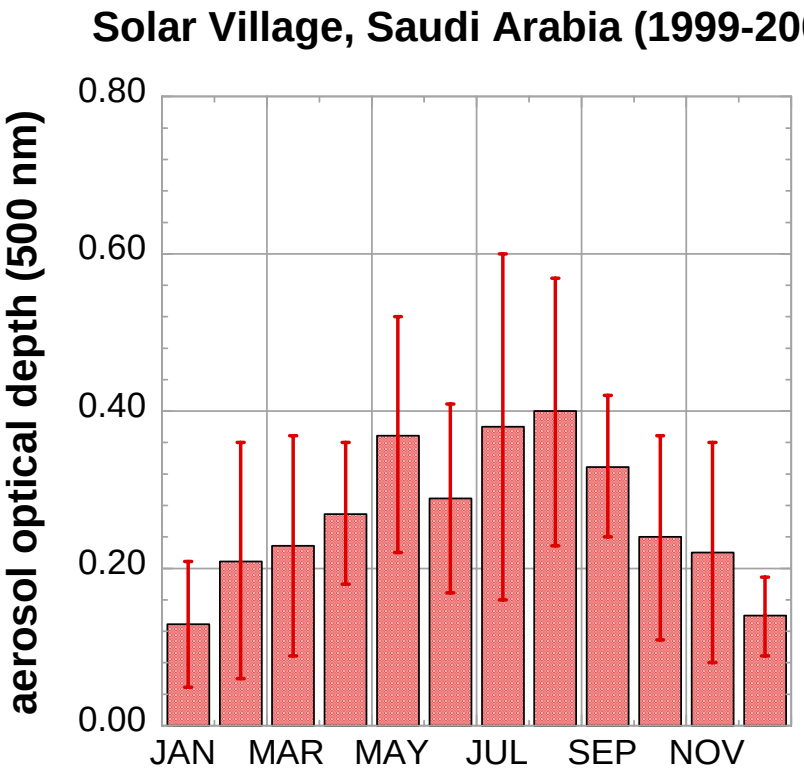
Data Format

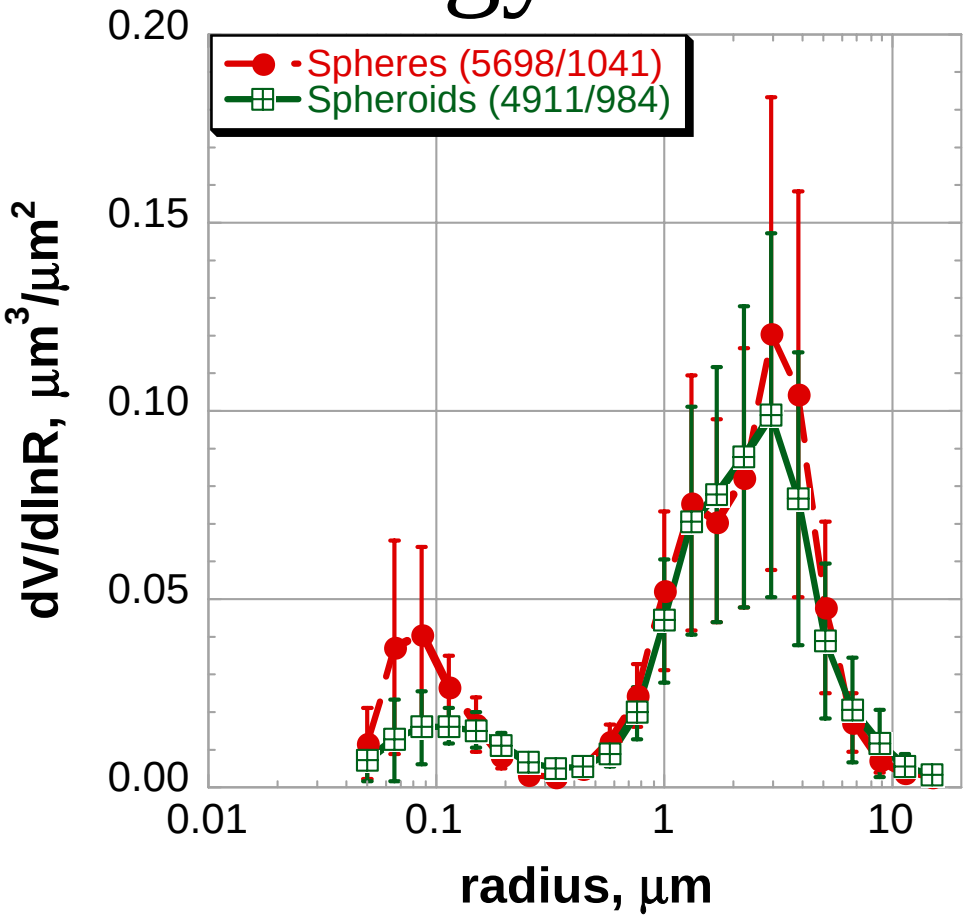
○ All Points	◉ Daily Averages	○ Monthly Averages

Download

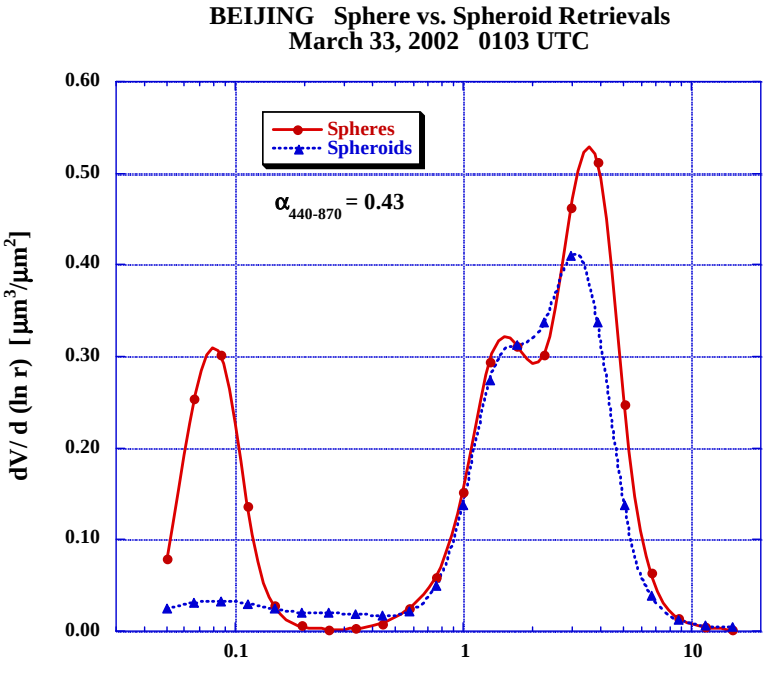
Please wait for the new window
(larger intervals will require longer processing time)

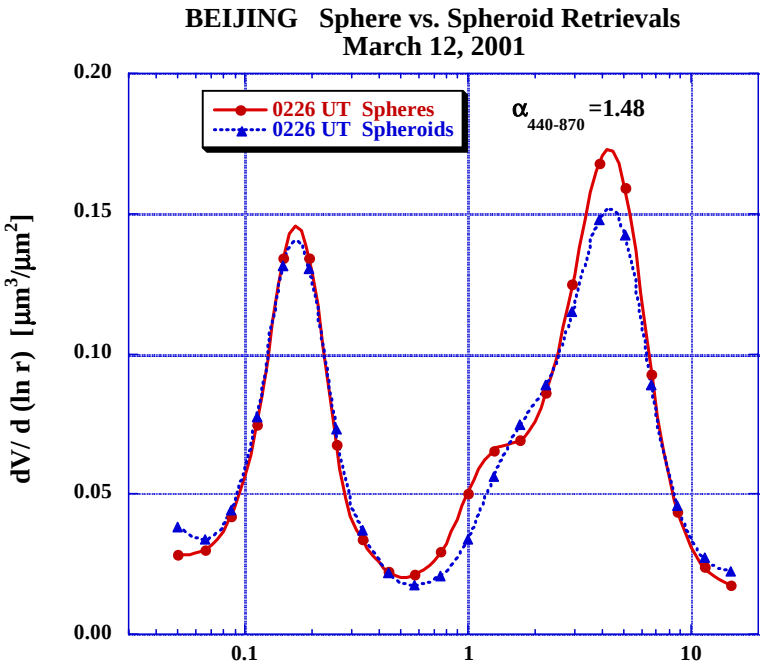
Aerosol Climatology

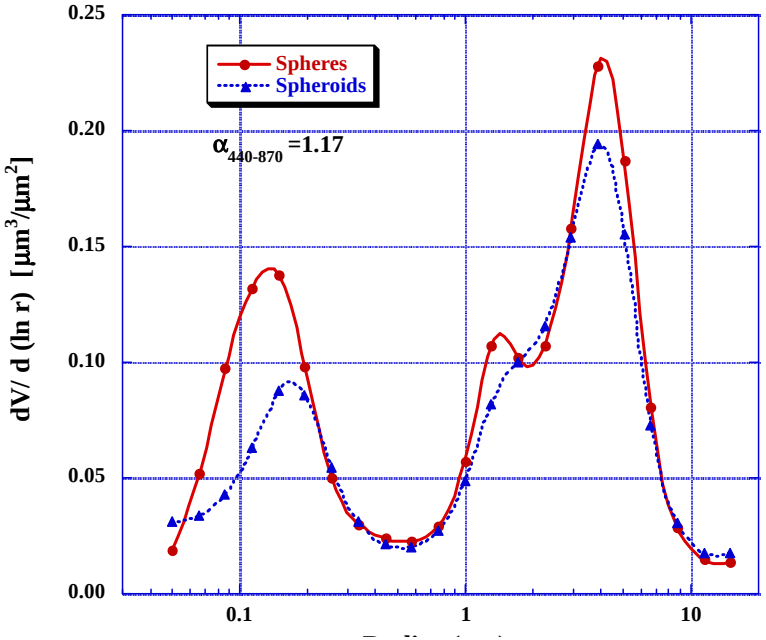


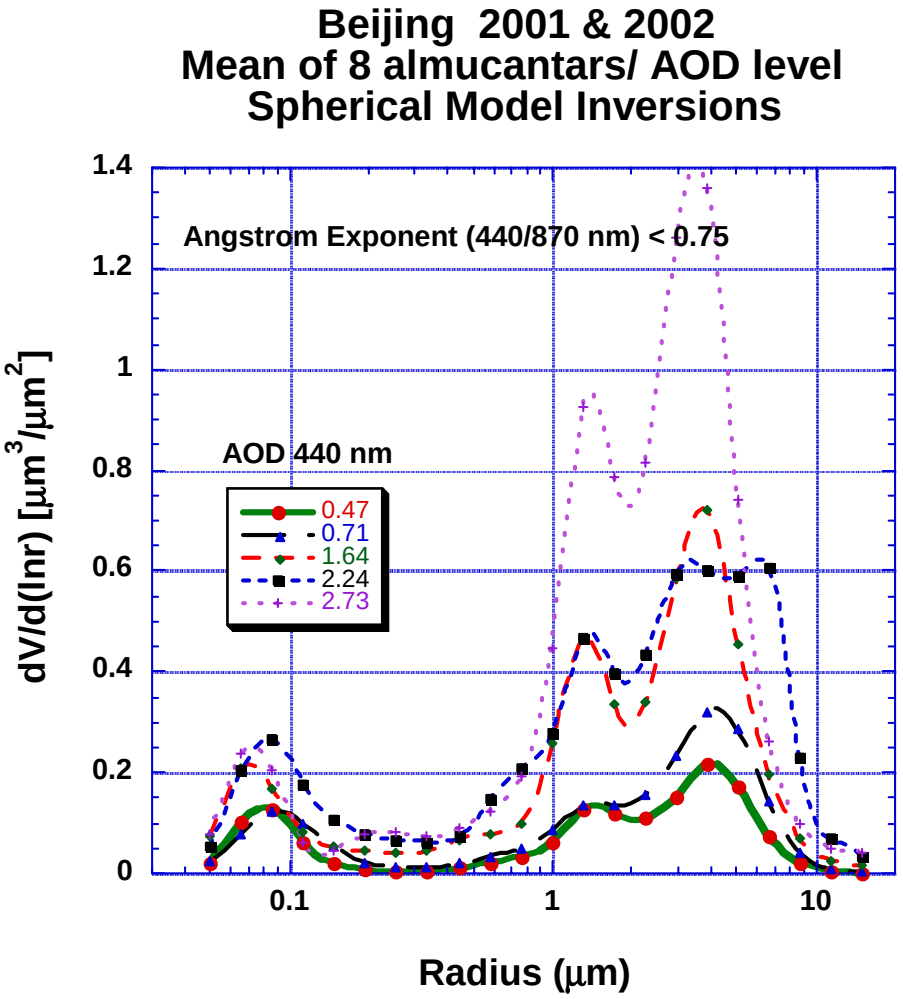


Performance of spheroid model for mixed aerosol with dust component

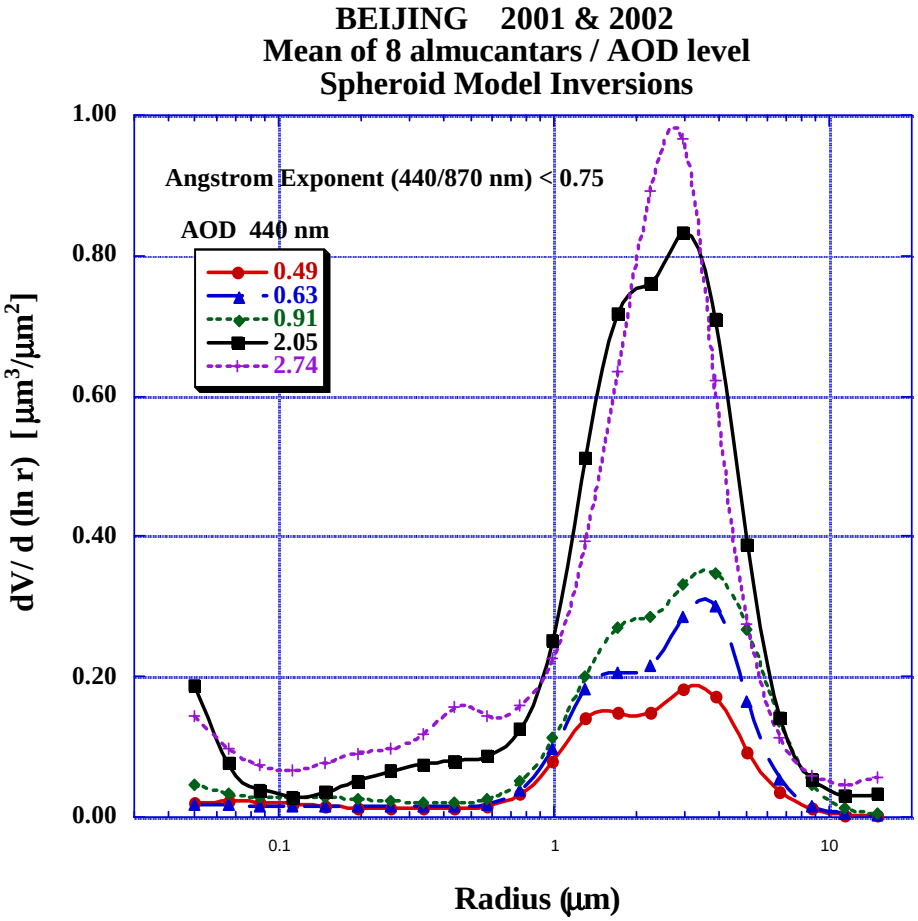




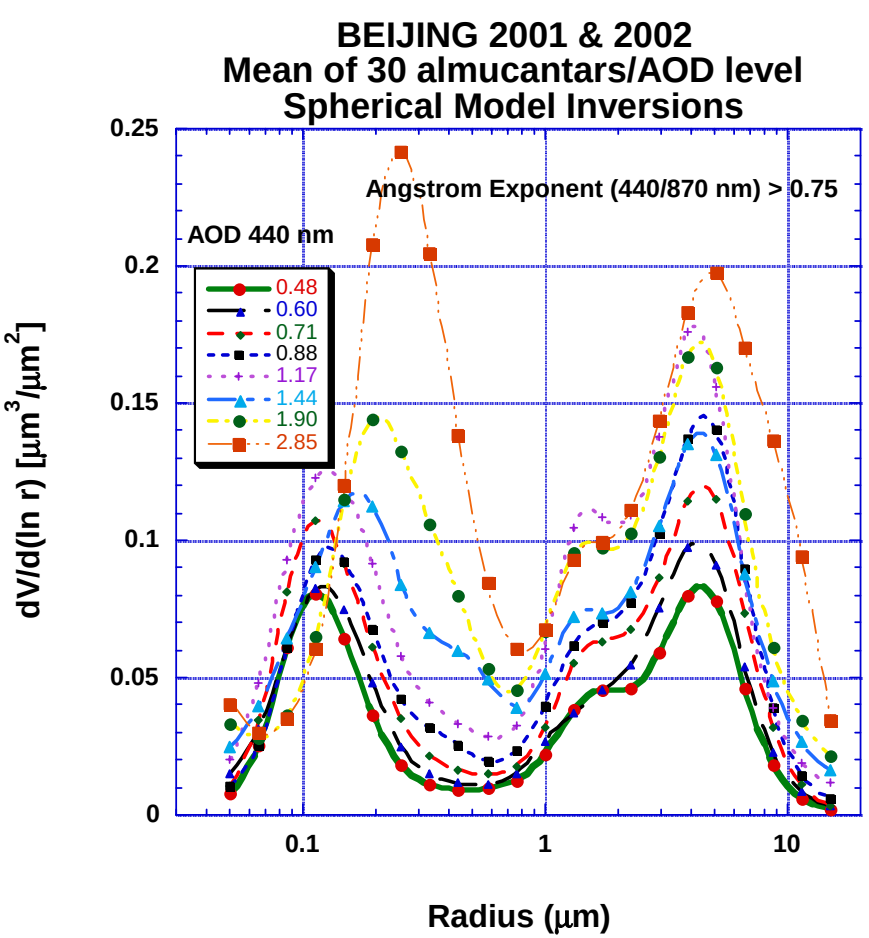




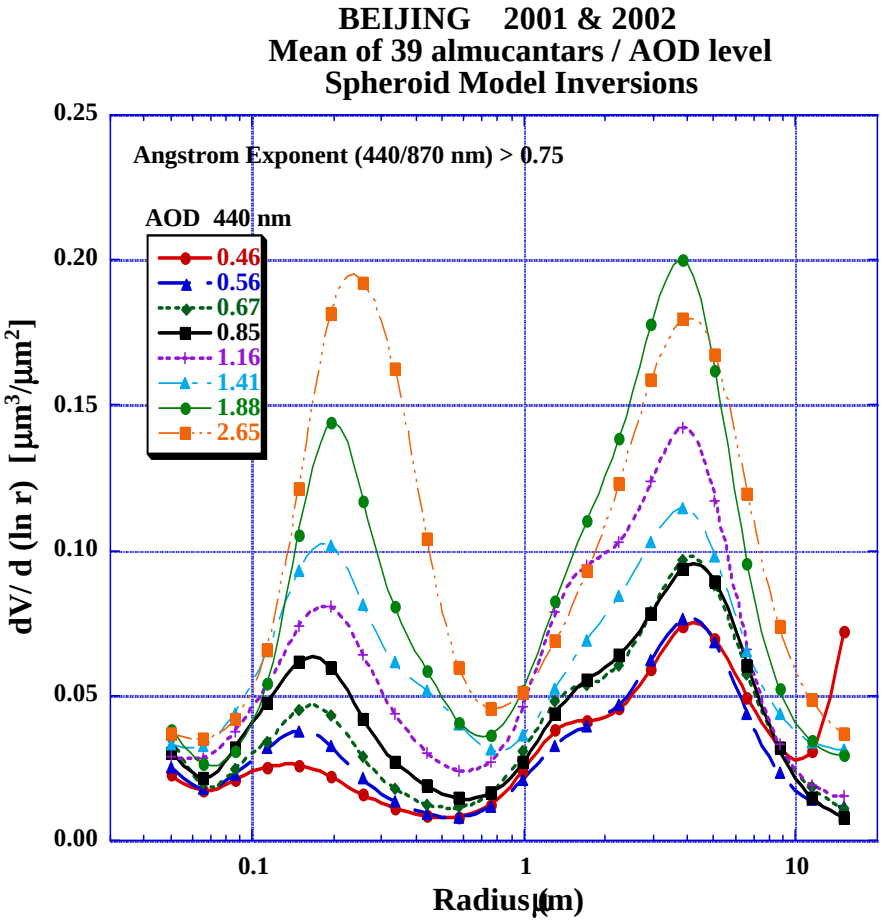
Spherical model



Spheroid model

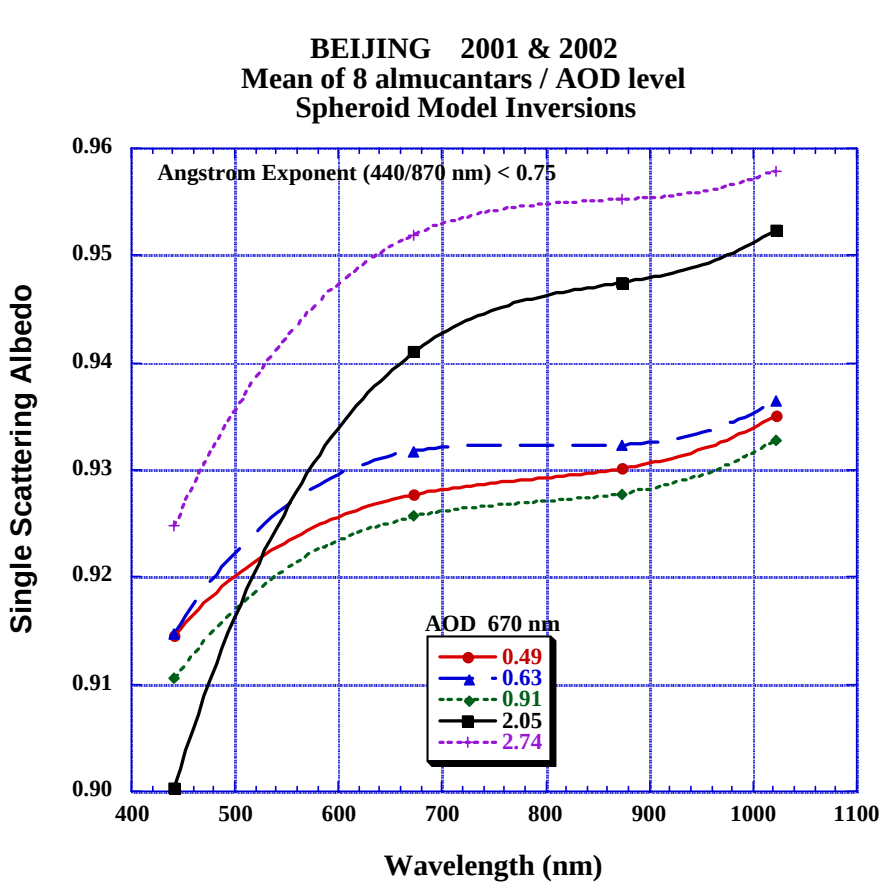


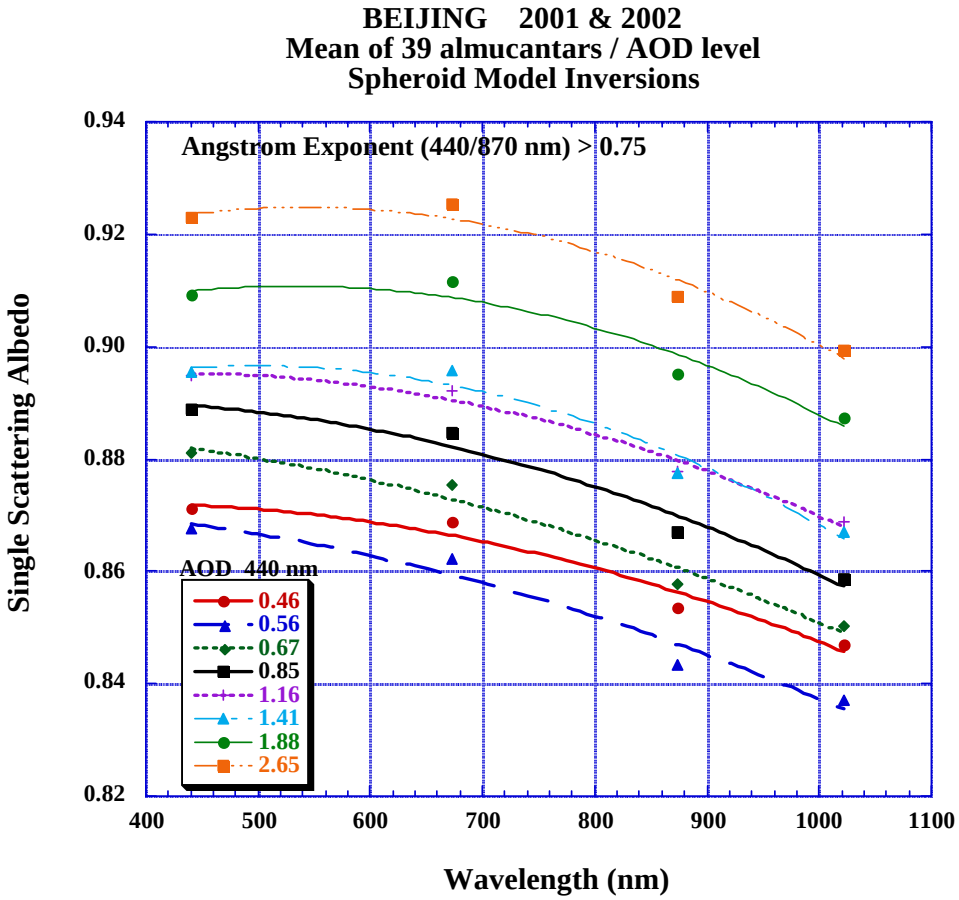
Spherical model



Spheroid model

Single Scattering Albedo





Spheroid model

AERONET Summary

- Network open for expansion into Asia, oceans, high latitudes, Africa
- New Extended wavelength instrument supported
- Ancillary data sets added to AERONET website (BT, MPL w/ possible sat imagery)
- Download Tool-Inversions QA'd, 'Recommended'
- Spheroid model inversions supported, recommended output eminent
- AEROSOL climatology supported for AOD