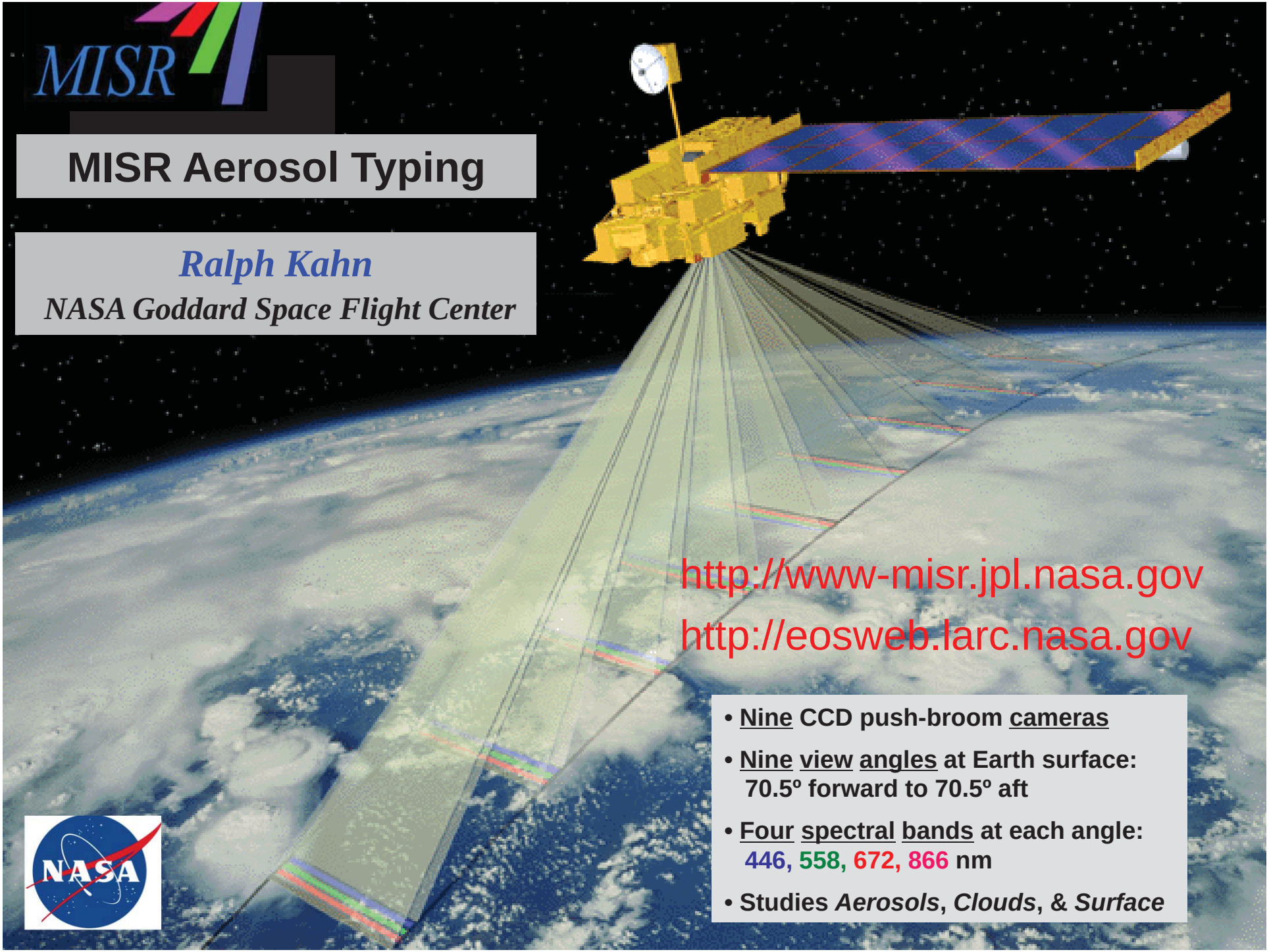
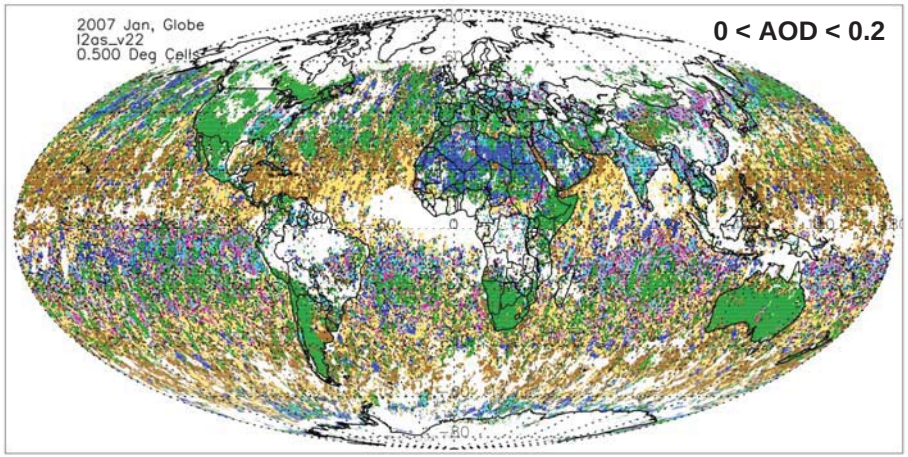
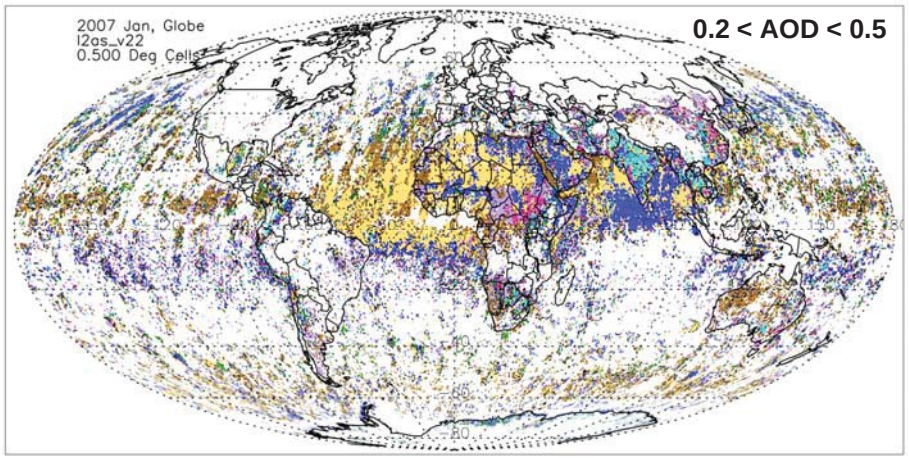

MISR
MISR Aerosol Typing
Ralph Kahn
NASA Goddard Space Flight Center
http://www-misr.jpl.nasa.gov
http://eosweb.larc.nasa.gov
• Nine CCD push-broom cameras
• Nine view angles at Earth surface:
70.5º forward to 70.5º aft
• Four spectral bands at each angle:
446, 558, 672, 866 nm
• Studies Aerosols, Clouds, & Surface
NASA

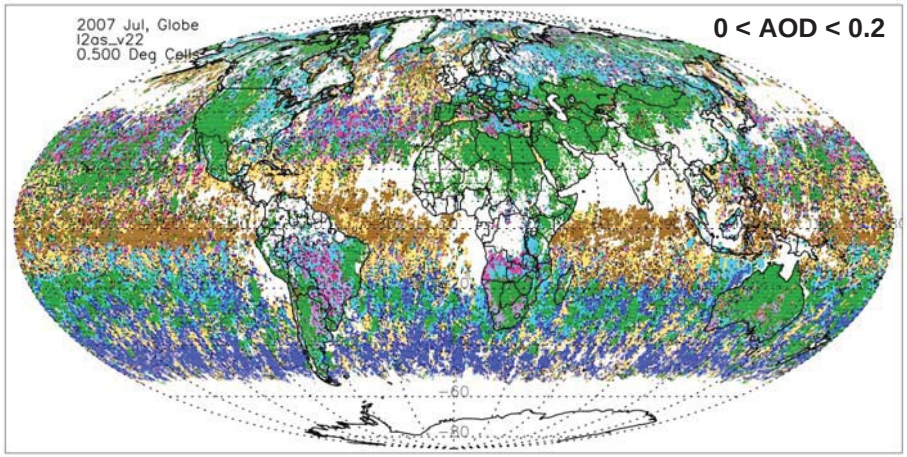
Global Distribution of MISR Most Frequently Retrieved Mixture Group

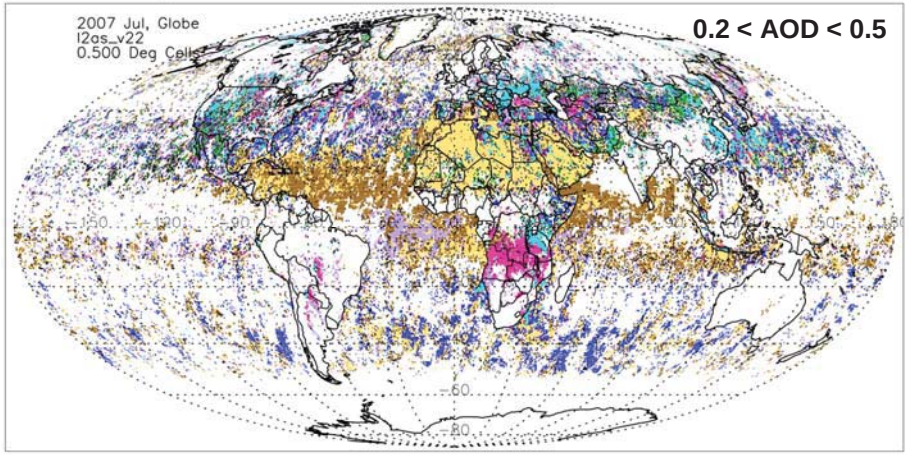
January 2007





July 2007





Mixture Group

1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-62 | 63-70 | 71-74

Spherical, non-absorbing

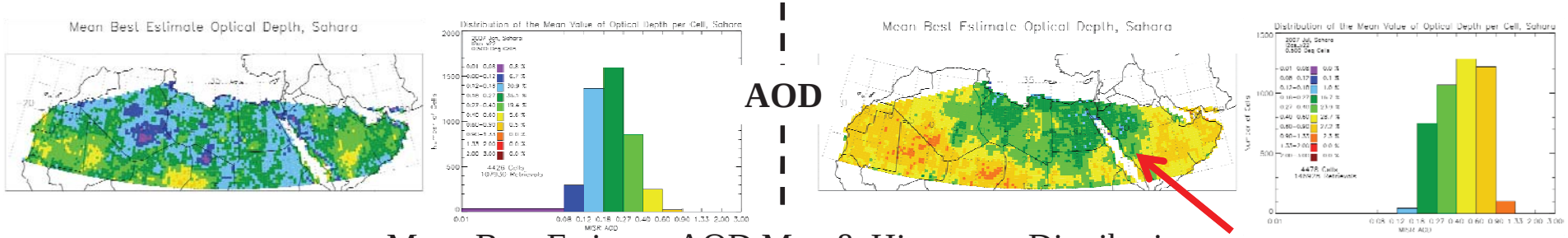
Non-spherical

Spherical, absorbing

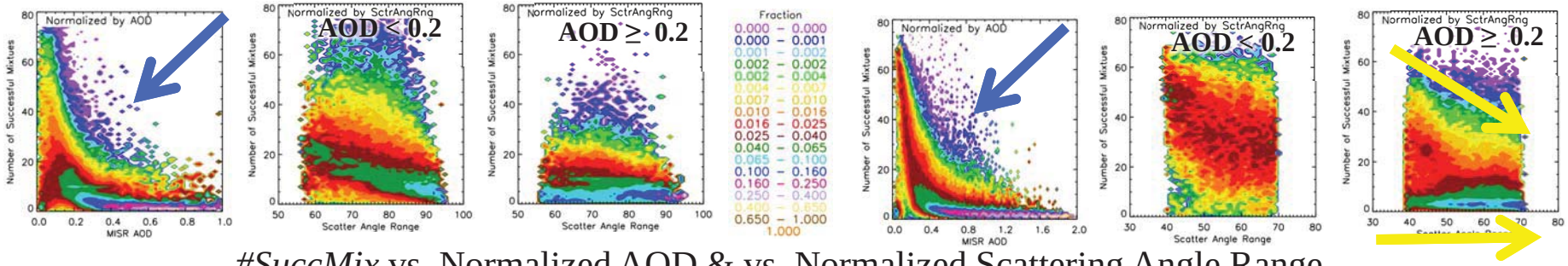
Kahn, Gaitley, et al. JGR, submitted

Sahara Desert

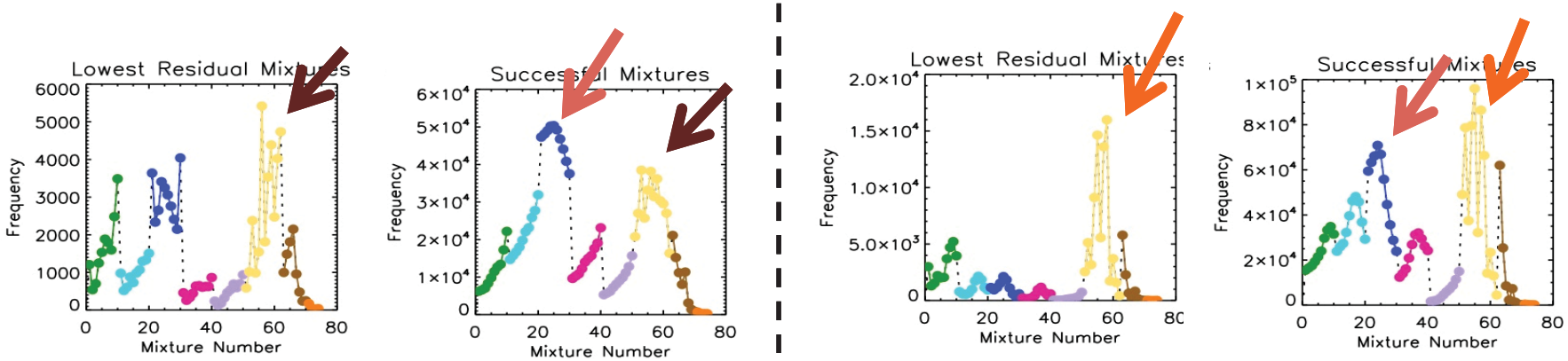
January 2007 | **July 2007**



Mean Best Estimate AOD Map & Histogram Distribution



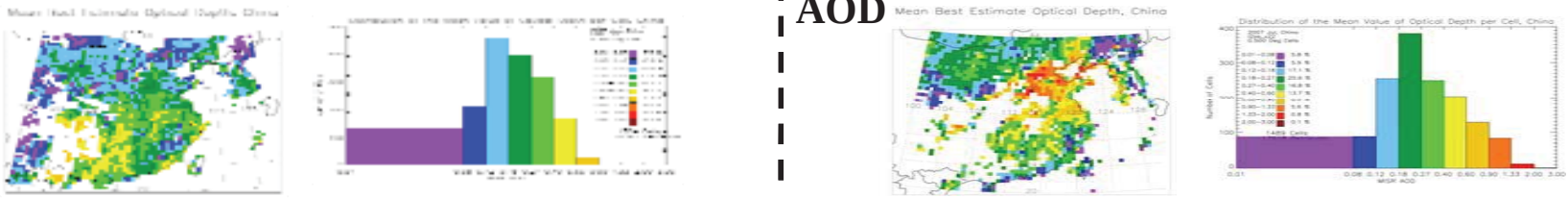
#SuccMix vs. Normalized AOD & vs. Normalized Scattering Angle Range



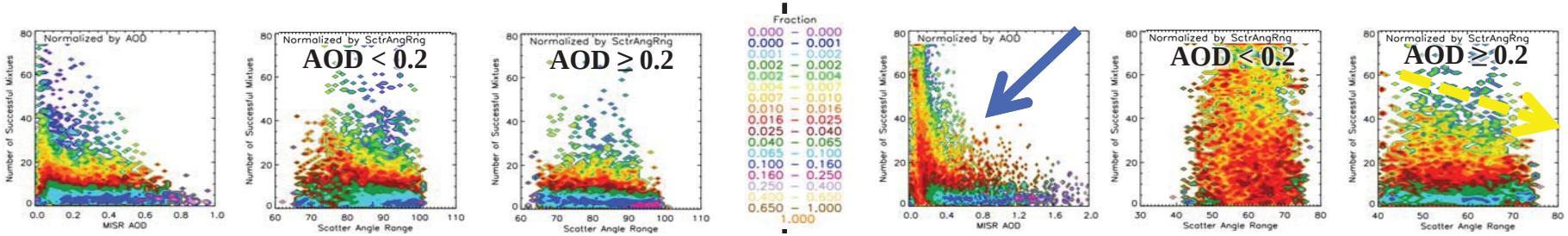
Histograms of Lowest Residual & All Successful Aerosol Type Mixture Groups

Kahn & Gaitley, JGR submitted

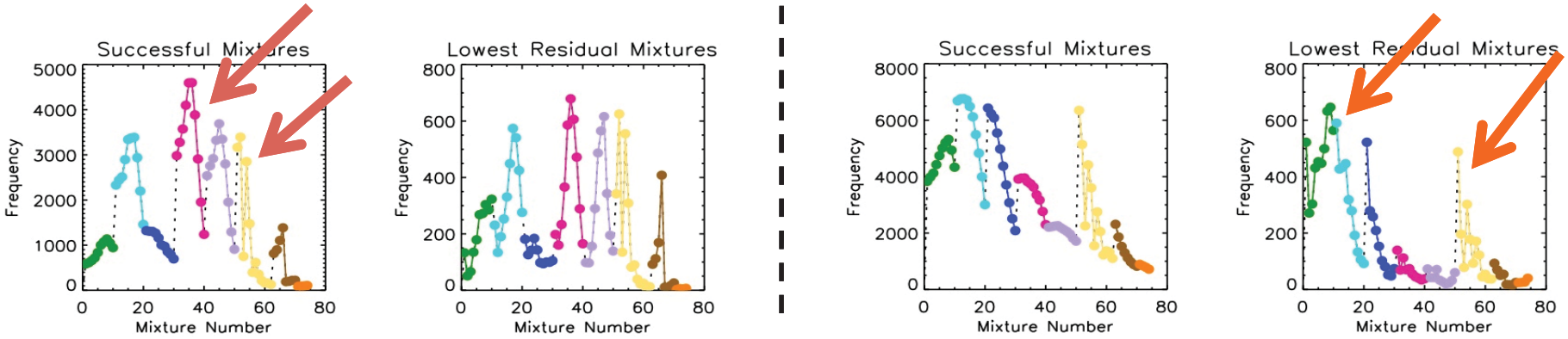
January 2007 **Eastern China (Pollution)** July 2007



Mean Best Estimate AOD Map & Histogram Distribution



Number of Successful Mixtures vs. Normalized AOD & vs. Normalized Scattering Angle Range

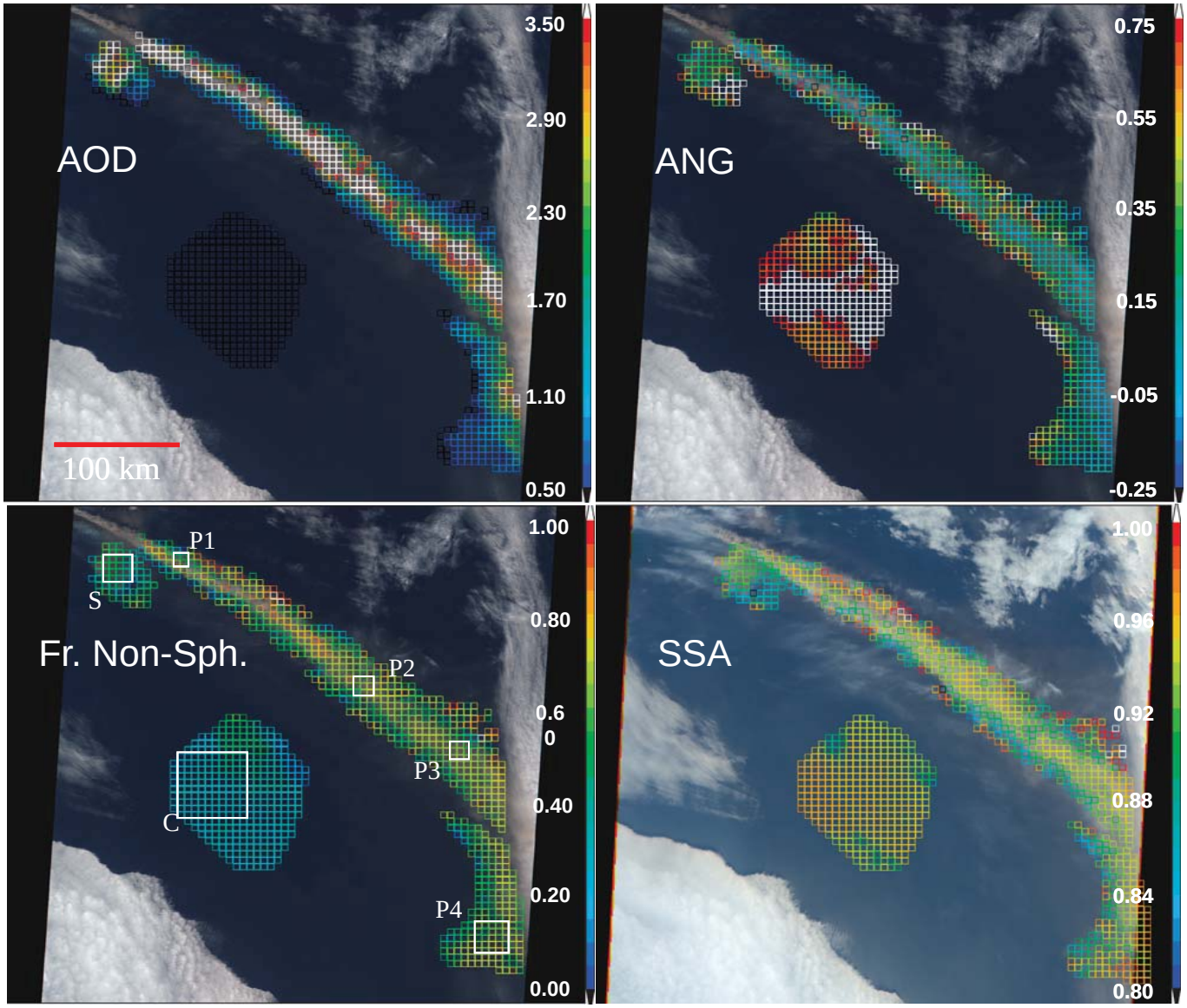


Histograms of Lowest Residual & All Successful Aerosol Type Mixture Groups

Kahn & Gaitley, JGR submitted

MISR Research Aerosol Retrievals

Iceland Volcano 07 May 2010 Orbit 55238 Path 216 Blk 40



Plume Particles

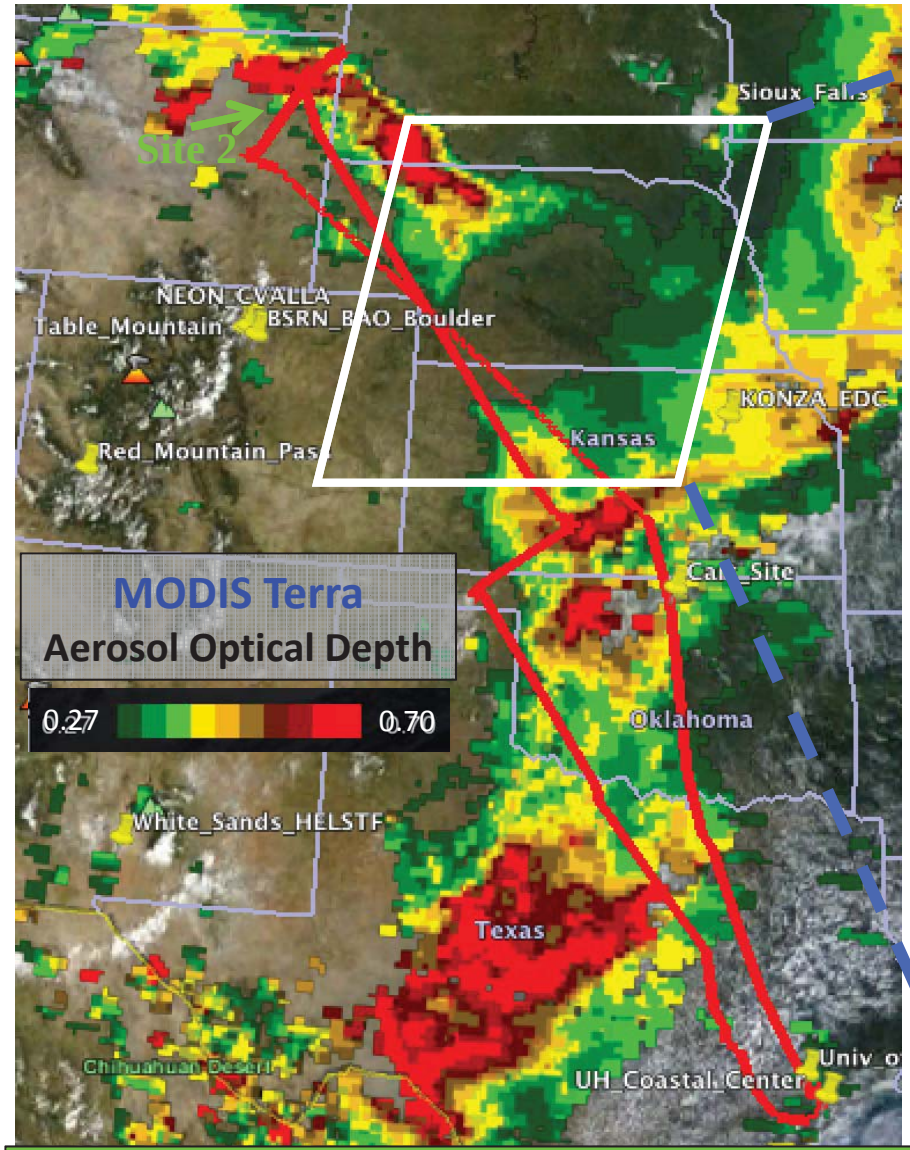
- Distinct from background
  - -- ***larger***, ***darker***
  - -- ***much higher AOD***
- ***Non-spherical*** dominated
- Brighten downwind
- Tend to decrease in size downwind

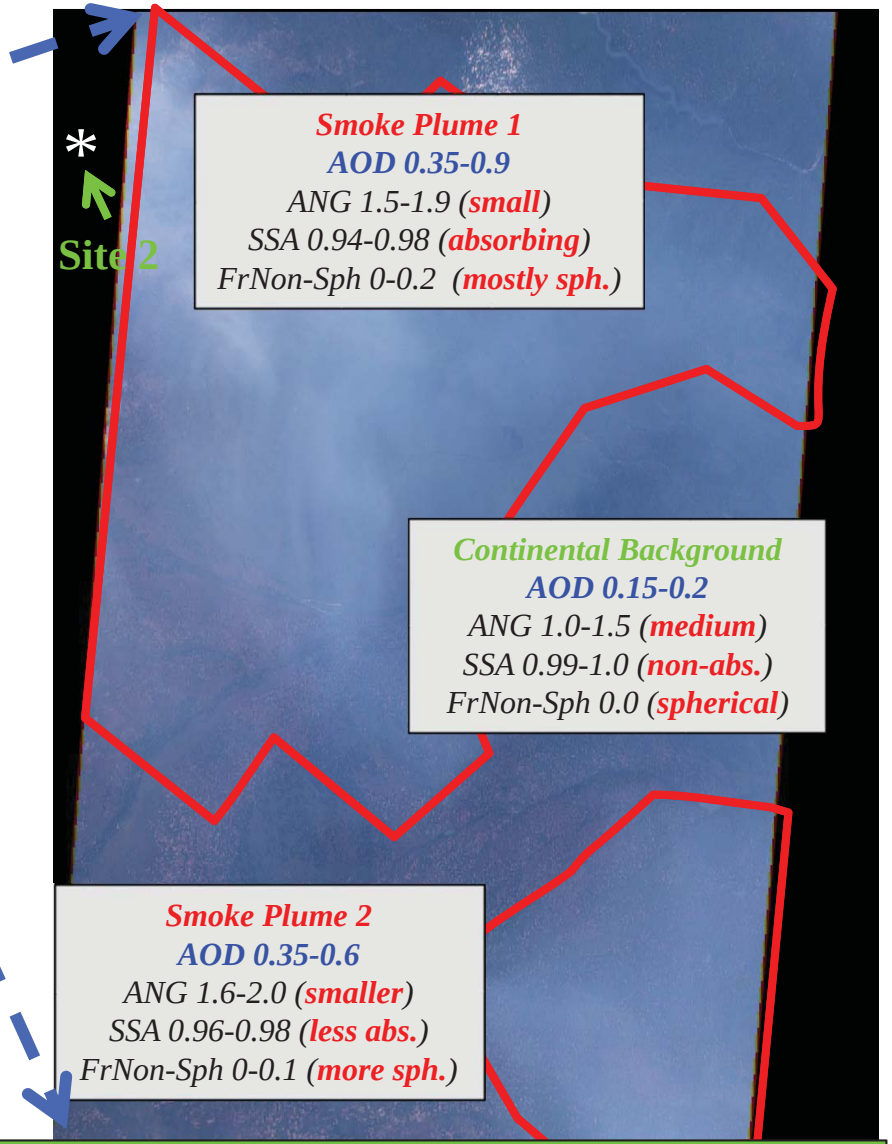
- ***1-2 days downwind*** (not shown):
- ***High AOD***
- ***Non-spherical*** dust grains
- ***Back-trajectory needed*** to identify plume confidently

Kahn & Limbacher, ACP 2012

SEAC^{4}RS Campaign DC-8 and ER-2 Flights

Monday, 19 August 2013





Passive-remote-sensing *Aerosol Type* is a *Total-Column-Effective*, *Categorical* variable!!

Backup Slides

Desert Site – Solar Village

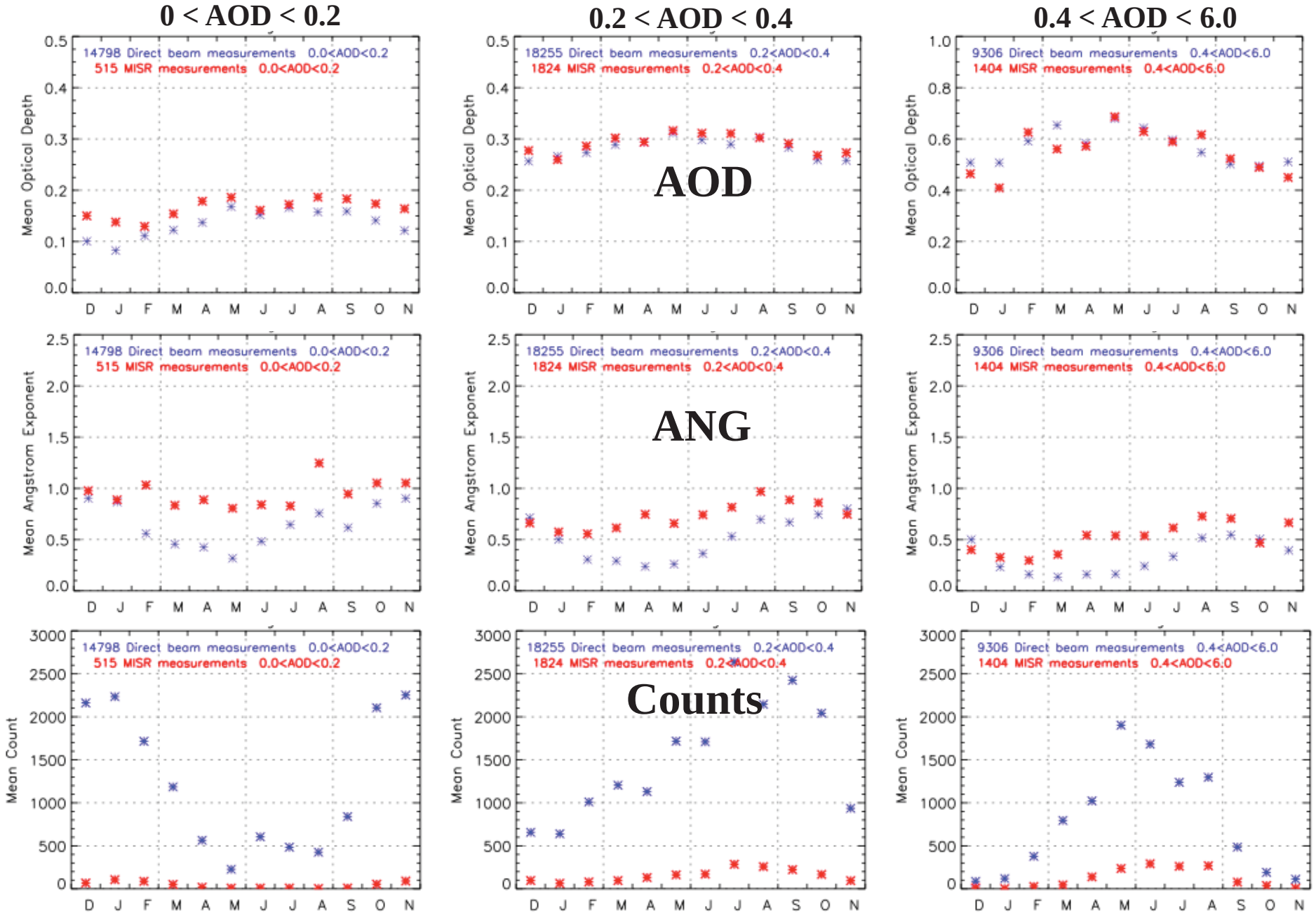


Figure 5

Desert Site – Solar Village

0 < AOD < 0.2

0.2 < AOD < 0.4

0.4 < AOD < 6.0

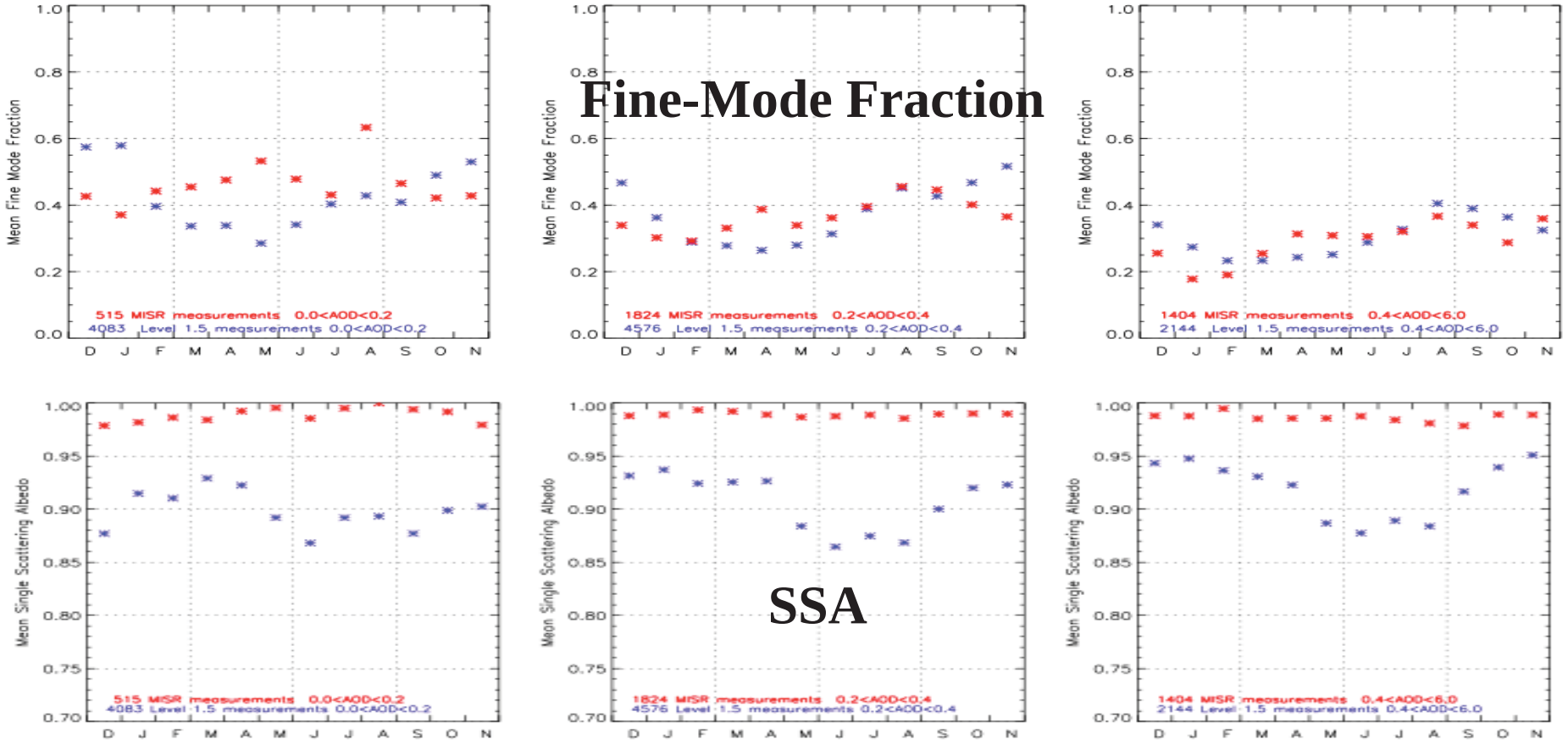
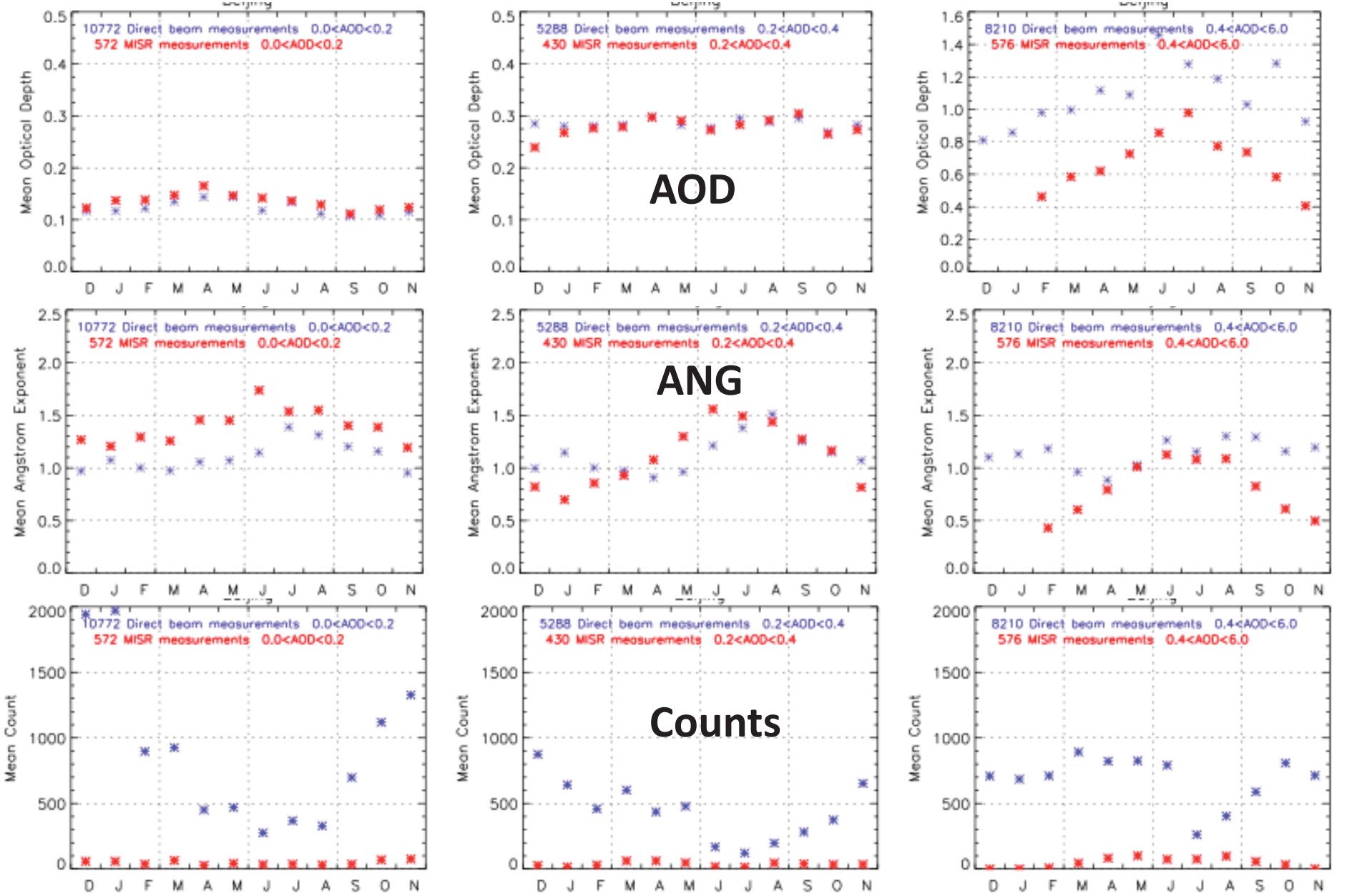


Figure 5

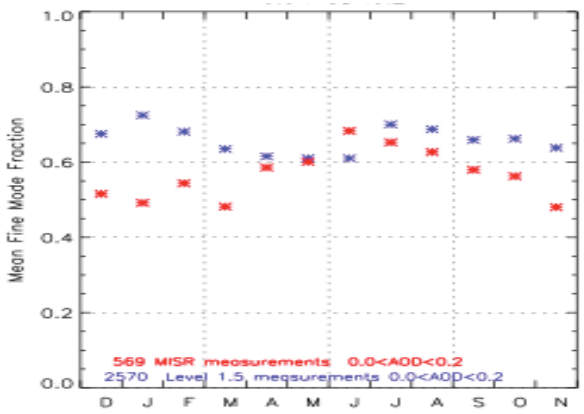
Urban Polluted Site – Beijing– MISR-AERONET Comparisons



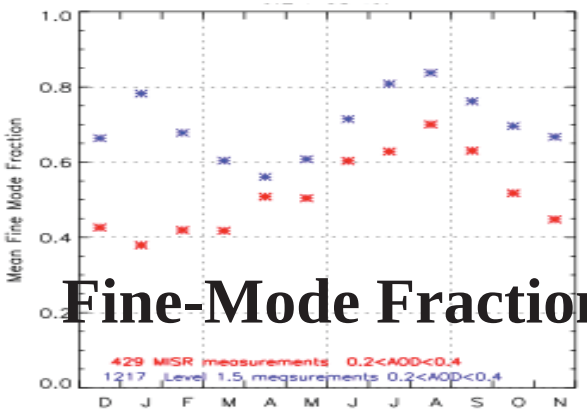
Kahn & Gaitley, JGR submitted

Urban Polluted Site – Beijing– MISR-AERONET Comparisons

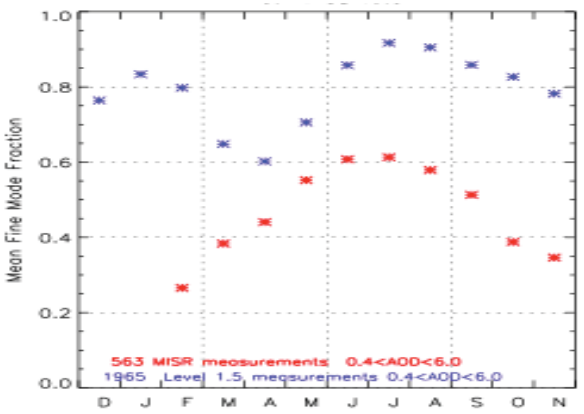
0 < AOD < 0.2



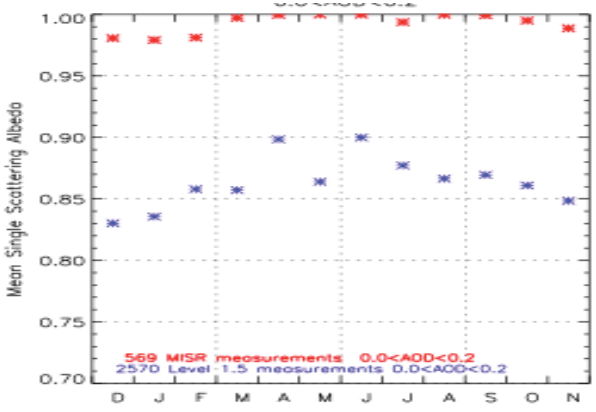
0.2 < AOD < 0.4

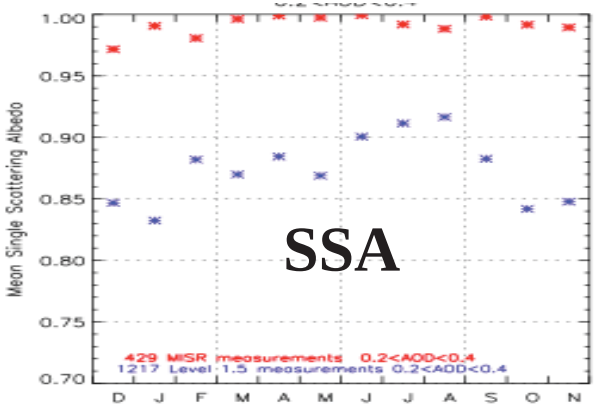


0.4 < AOD < 6.0

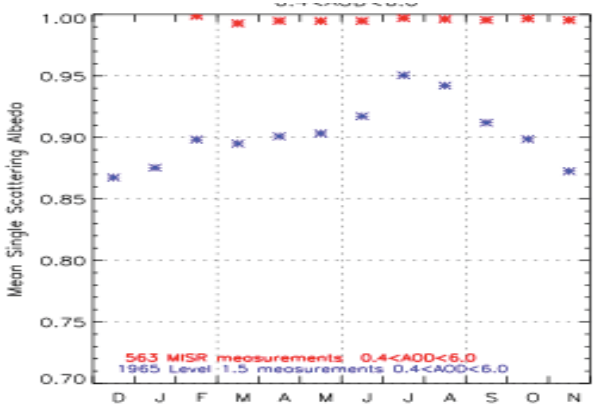


Fine-Mode Fraction





SSA



Kahn & Gaitley, JGR submitted