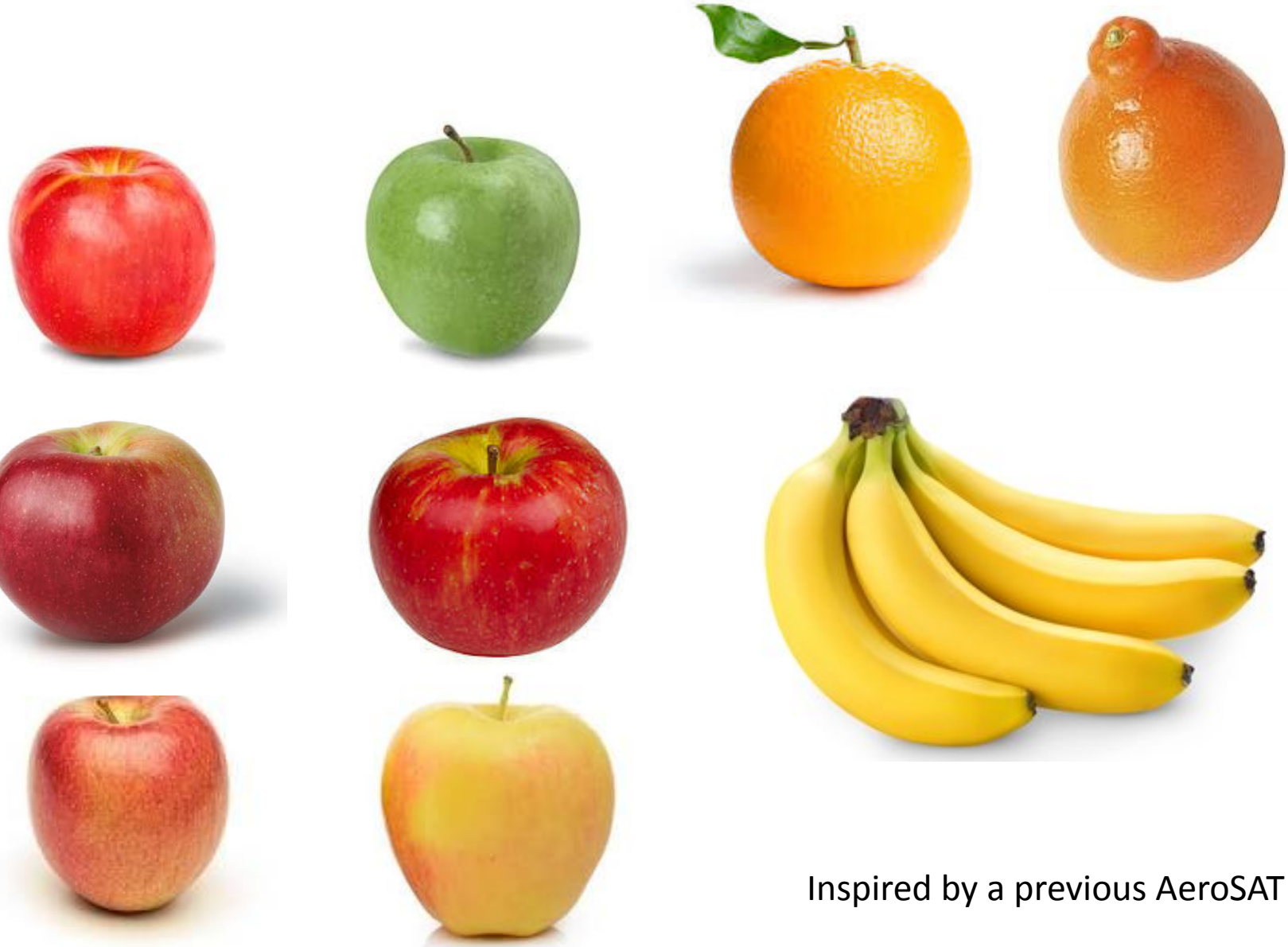
Working group on Inter-comparisons

Apples vs Apples? Vs Oranges? **Bananas**!



Inspired by a previous AeroSAT

MODIS DT versus MODIS-DB
(same instrument, different algorithm)

MODIS-Terra vs MODIS-Aqua (same variety, but different)

Suomi-NPP vs MODIS-Aqua (different variety)

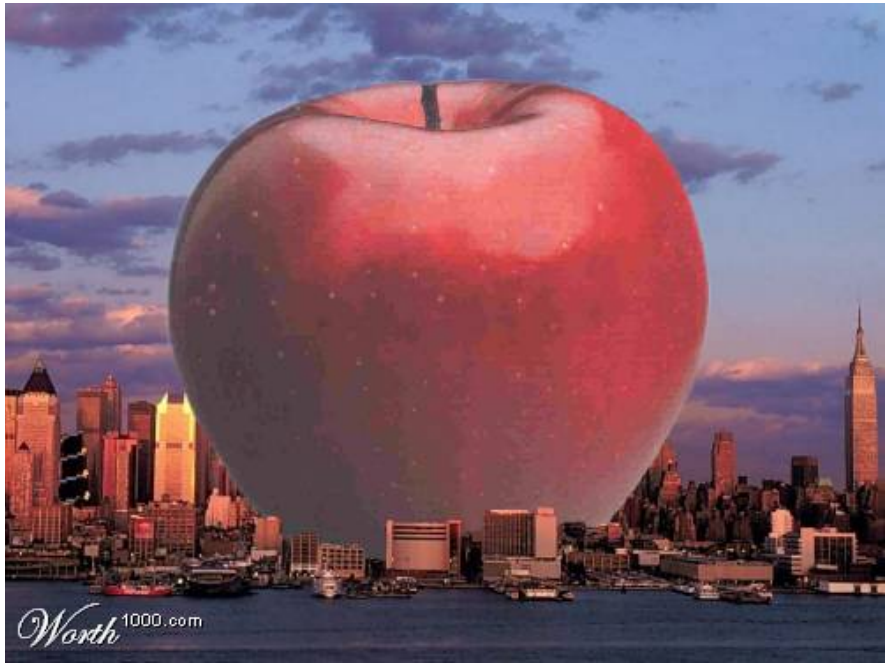
AATSR versus MODIS
Two angles versus one

MISR vs MODIS
multi- versus single angle

TOMS/OMI/OMPS/ vs MODIS
UV versus VIS/NIR/IR

CALIOP vs MODIS
active versus passive

GEO vs LEO
diurnal resolution versus not



The truth

The goal?

Technical Differences

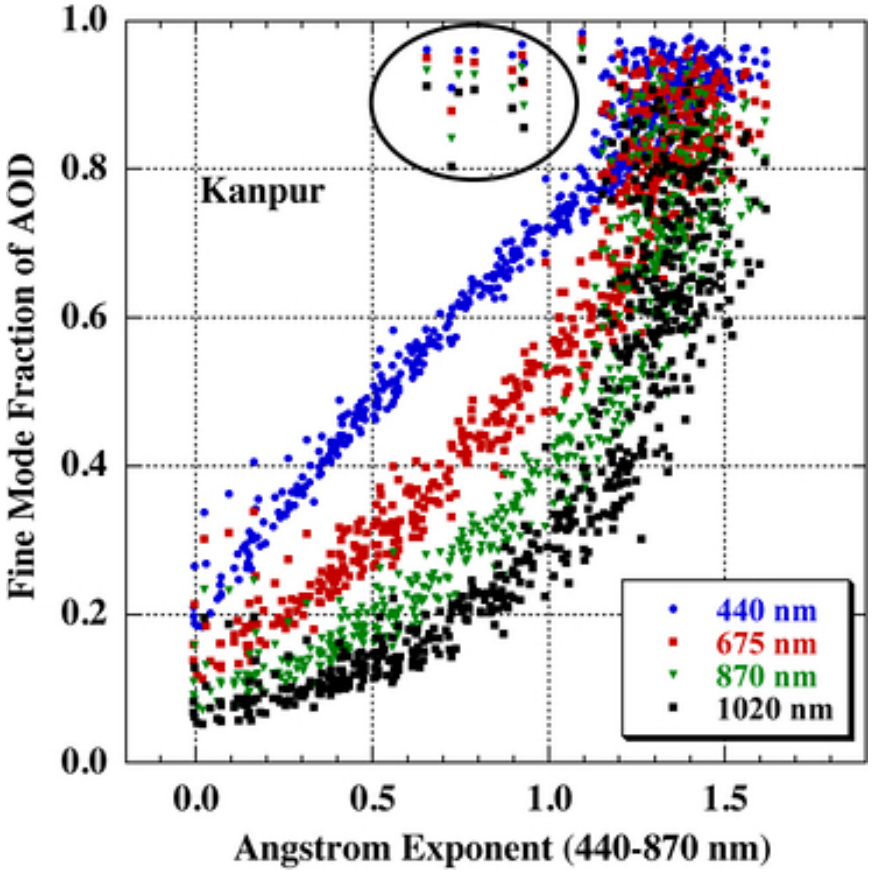
- Bands, resolution, temporal, calibration
- Time of day, viewing angle, viewing height
- Sensitivity to clouds (detection, masking, 3-D effects, etc)

Differences in Data Handling

- Algorithmic
- Data transmission – VIIRS data redution

Definitions and Cross Comparisons

- Fine mode, Fine mode fraction, Angstrom Exponent



From Eck et. al. 2012

Definitions and Cross Comparisons

- Fine mode, Fine mode fraction, Angstrom Exponent

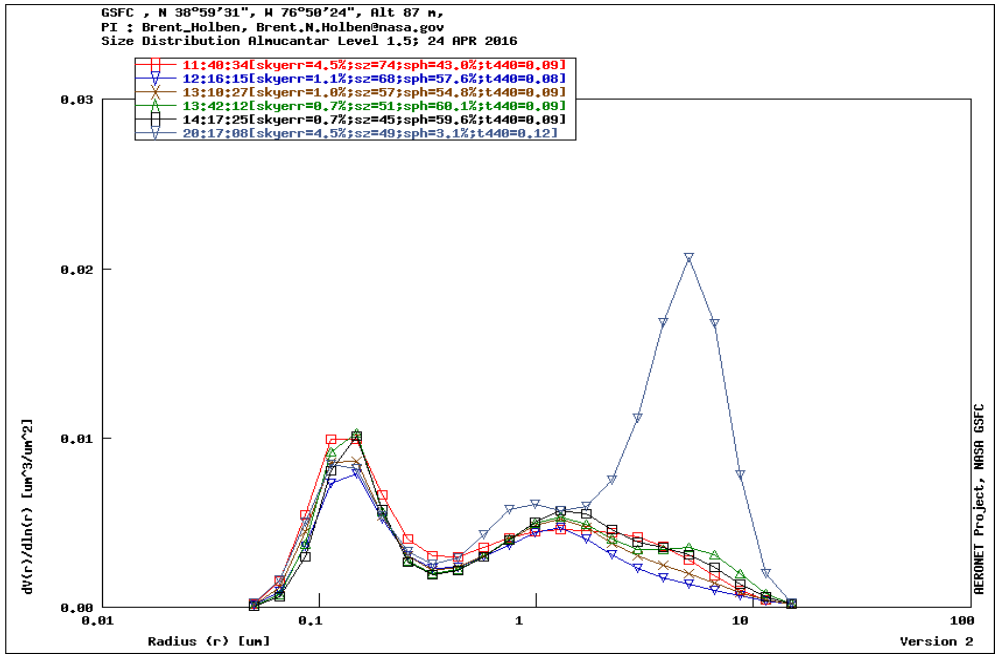
- Particle Size (optical, aerodynamic, geometric)

- Boundary Layer (wind, cloud, temperature?)

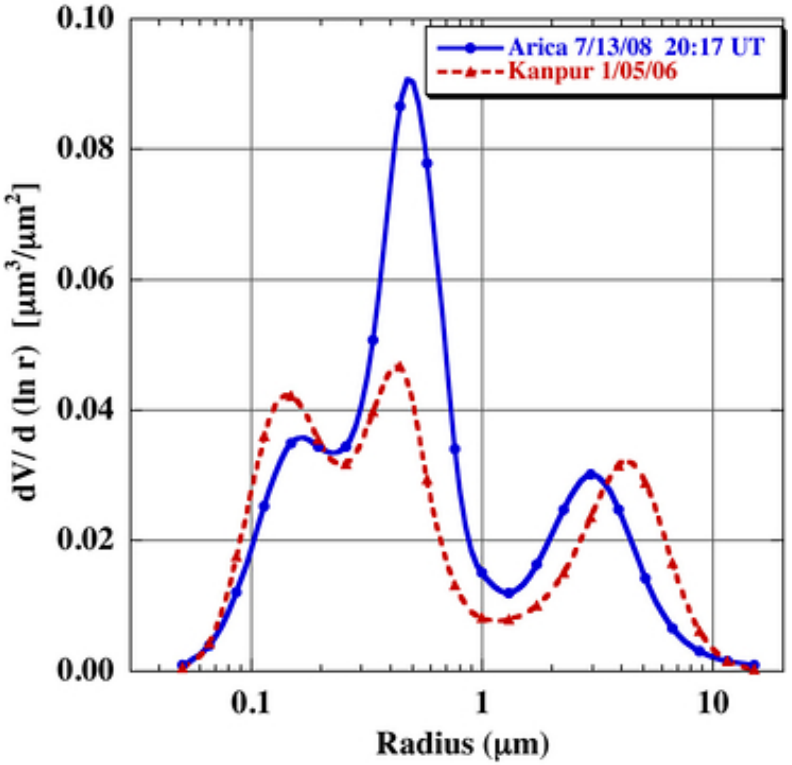
- Column vs Layer Measurements

- Aerosol Type

Examining our Retrieval Assumptions



From Eck et. al. 2012



Bimodal Lognormal Distributions? >2 modes?
Gamma distribution?

Surface constraints? Models? Etc

Validation

Are we tuning our aerosol products to AERONET?

- What are the potential consequences?

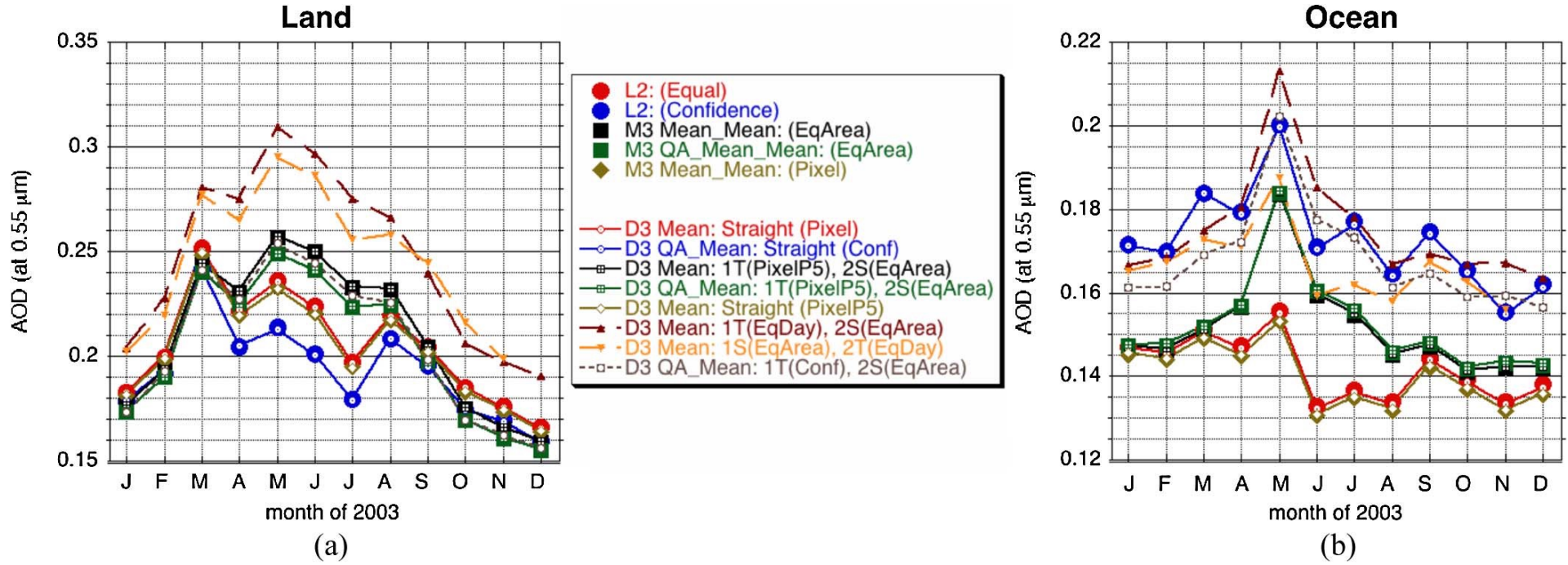
  What alternatives do we have?

Gridding for comparisons

Sampling, aggregation and averaging

What are the potential consequences?

What alternatives do we have?



Without finding worms in our apples

As more sensor types are added comparisons will only become more difficult.

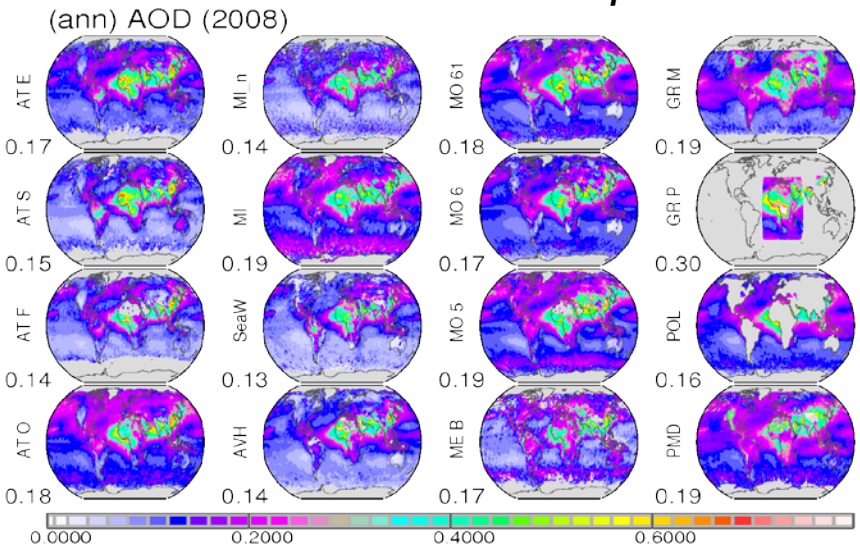
How should we compare products to get useful information?

How do use other tools?

- Data assimilation?
- Neural nets?
- Multl-sensor fusion (at Level 1)?

Talk in this session

Stefan Kinne et al.,
GEWEX-GDAP inter-comparisons



Can we improve satellite retrievals of Ångström exponent over land?

Antti Lipponen, Tero Mielonen, and Antti Arola
Finnish Meteorological Institute, Kuopio, Finland

Without correction

With post-process correction