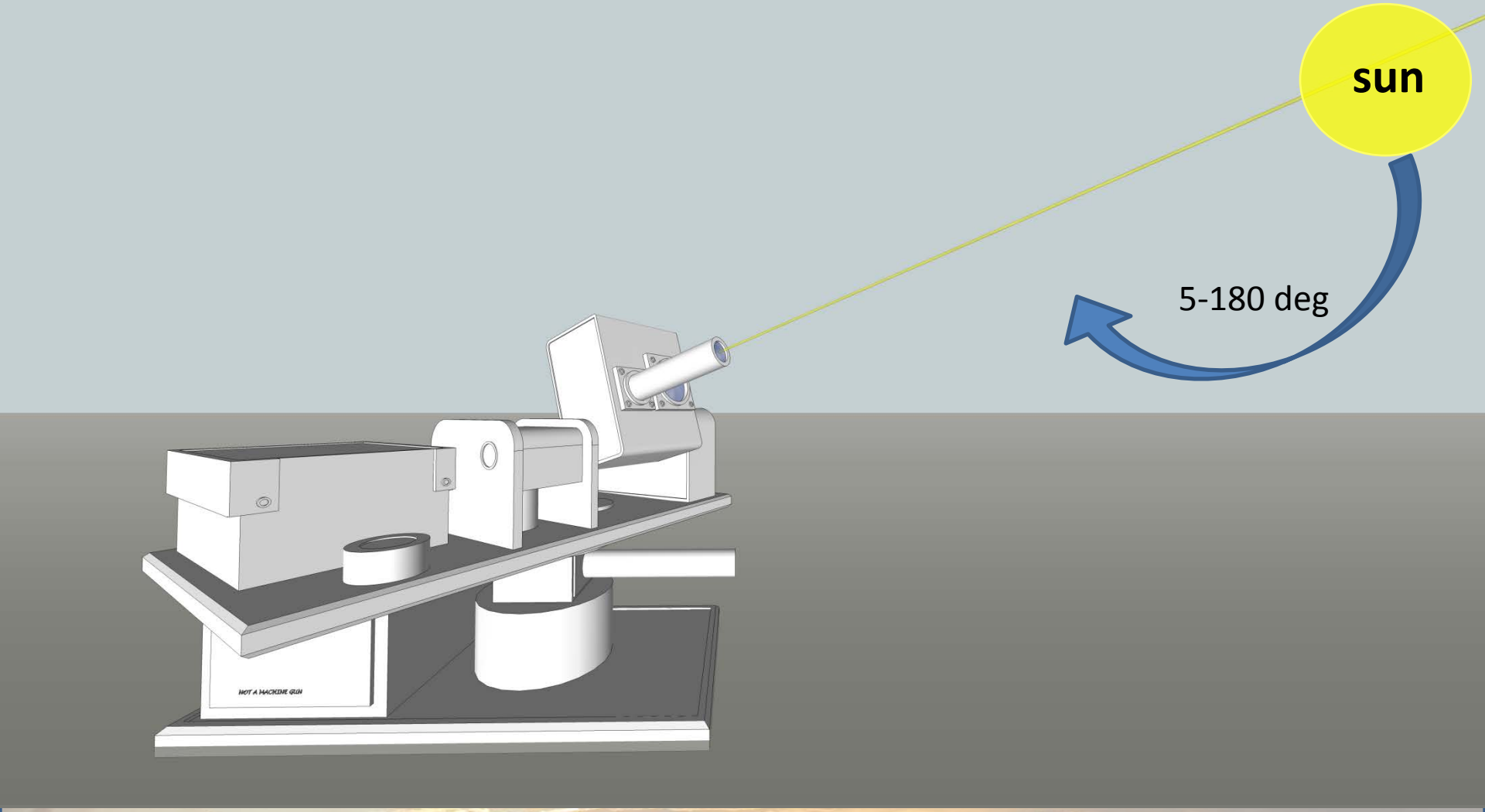
Demonstration of 2D MAX-DOAS during TCAP

A) ARM site at Cape Cod, MA
B) 2D-MAX-DOAS telescope
C) indoor electronic

3 spectrometers Ocean Optics, 300-631 nm, 0.4-0.6nm FWHM

And a bunch of more instruments….
e.g, CE-DOAS

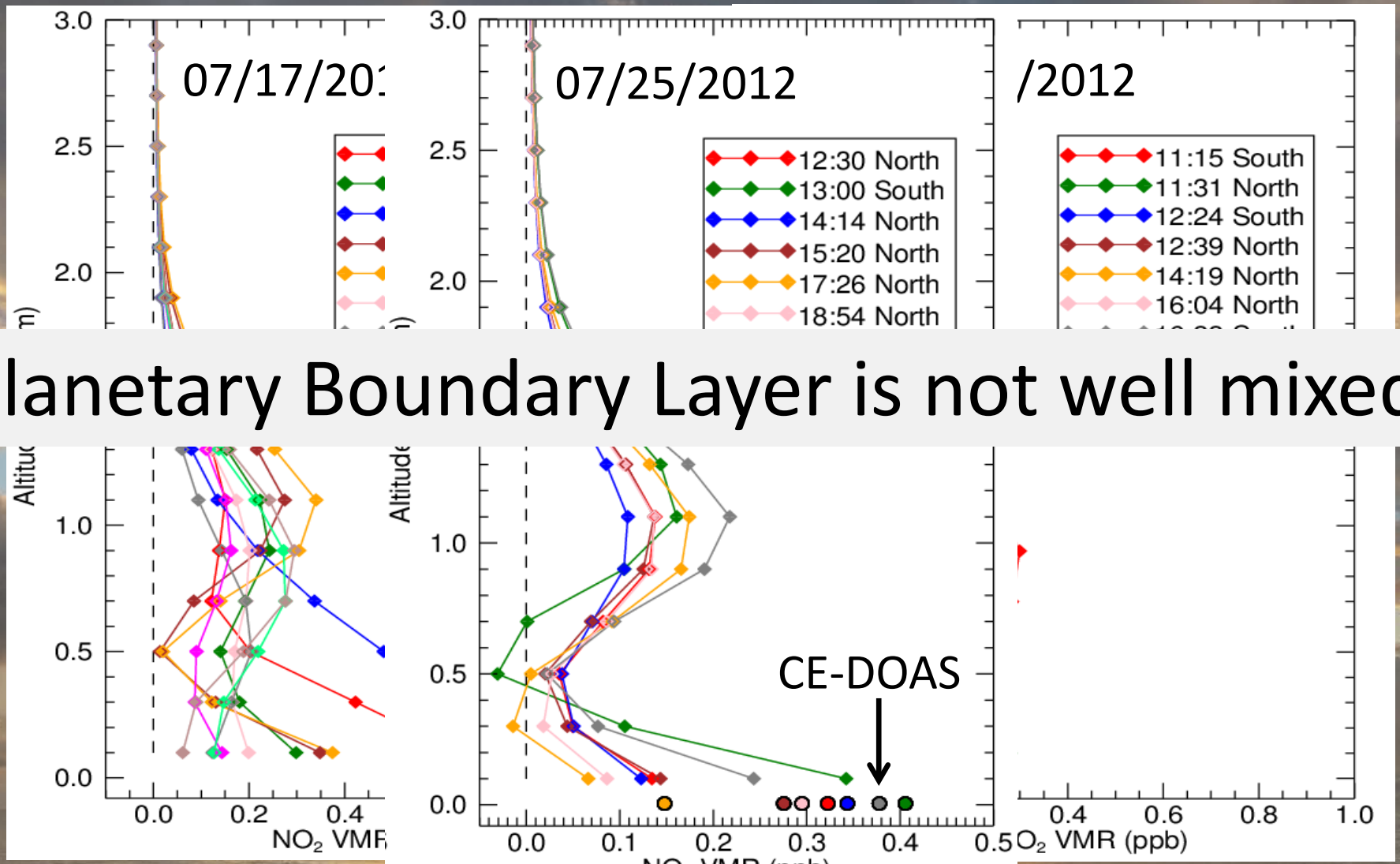


Mode 1: Elevation Angle Scan - photons travel on parallel paths from the sun to the Earth‘s atmosphere. The telescope collects photons from discrete viewing directions.

Mode 2: Azimuth Scan relative to the sun

Mode 3: Direct Sun measurements

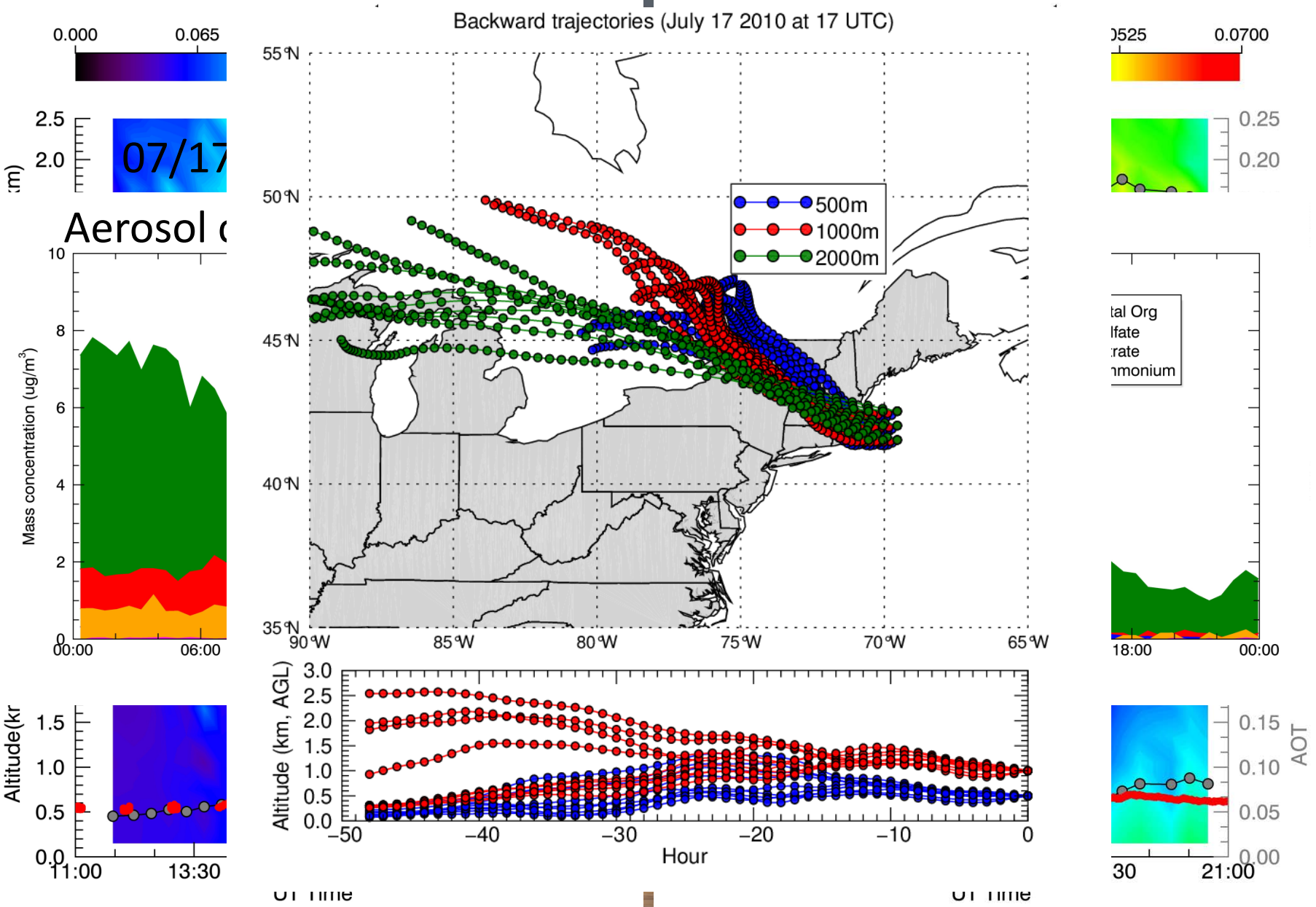
NO_2 profiles during TCAP



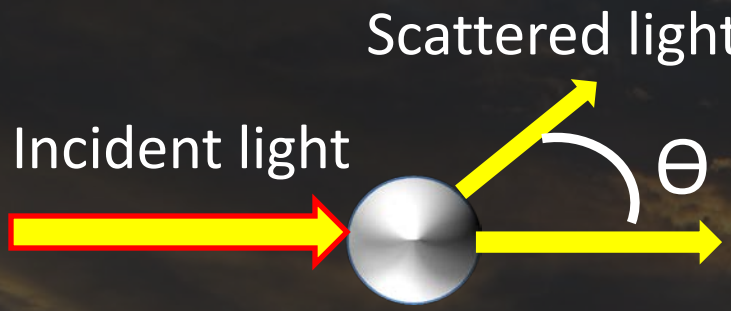
Planetary Boundary Layer is not well mixed

Ortega et al., manuscript in in preparation

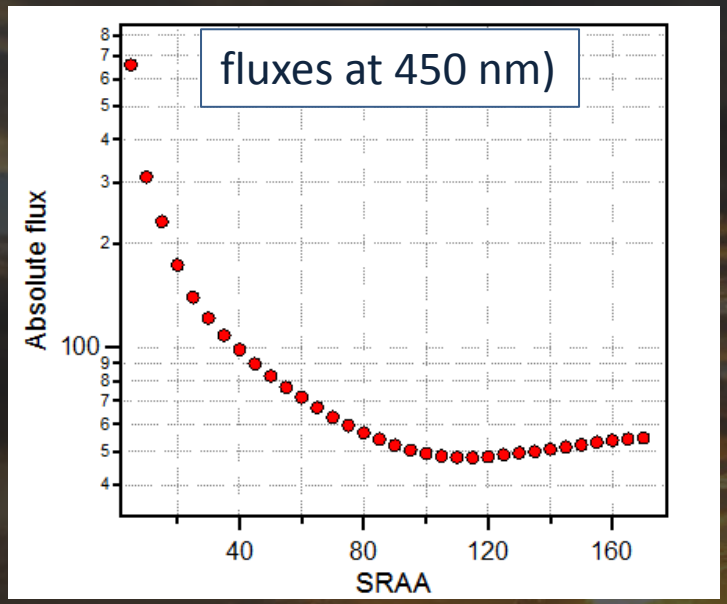
A tale of two days

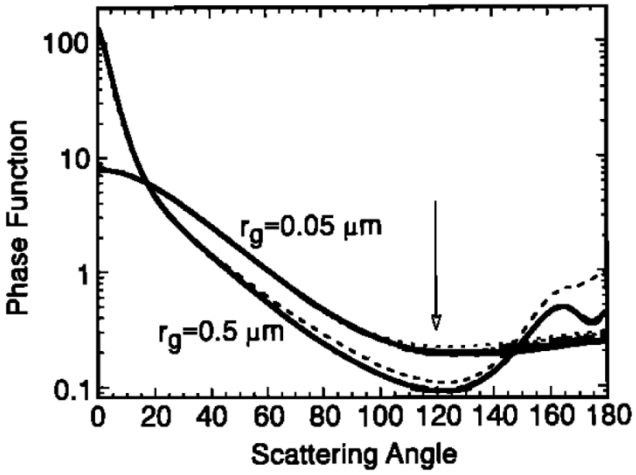


Phase function & microphysical properties?



The angular distribution of scattered light is the phase function





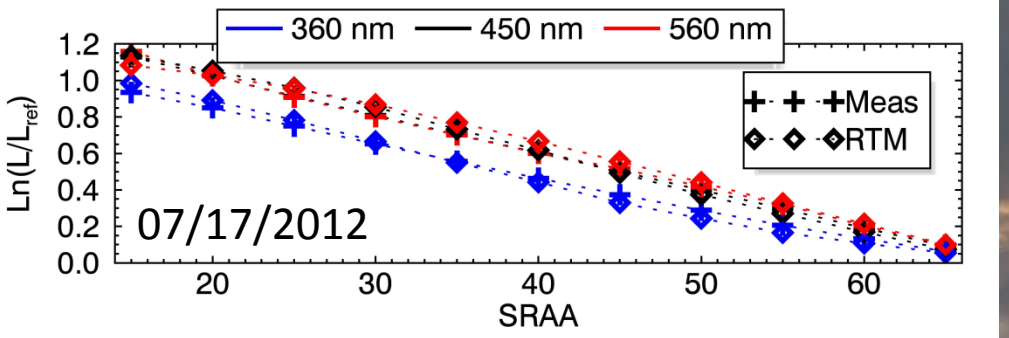
Θ is the ***scattering angle***.

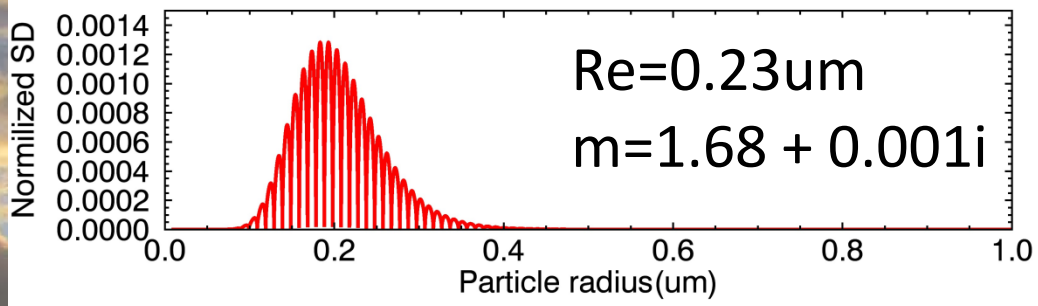
$0 \leq \Theta \leq 90$ is forward scatter

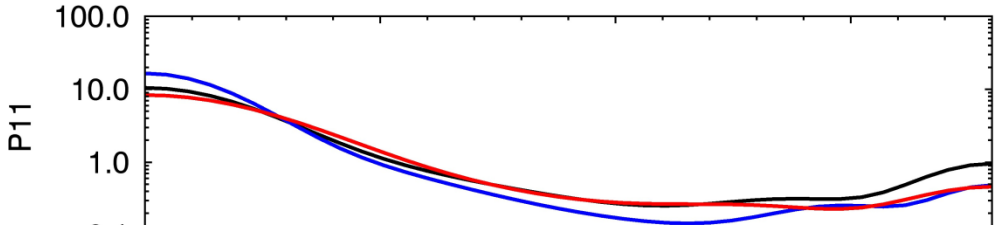
$90 < \Theta \leq 180$ is back scatter

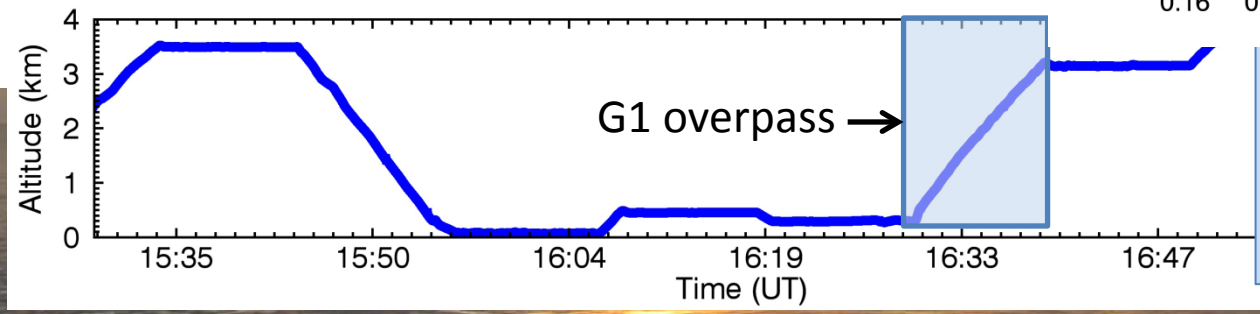
Modeling the aerosol effects on atmospheric radiation, by solving the radiative transfer equation, requires: extinction; phase function and **single-scattering albedo (ratio of scattering/scattering +absorption).**

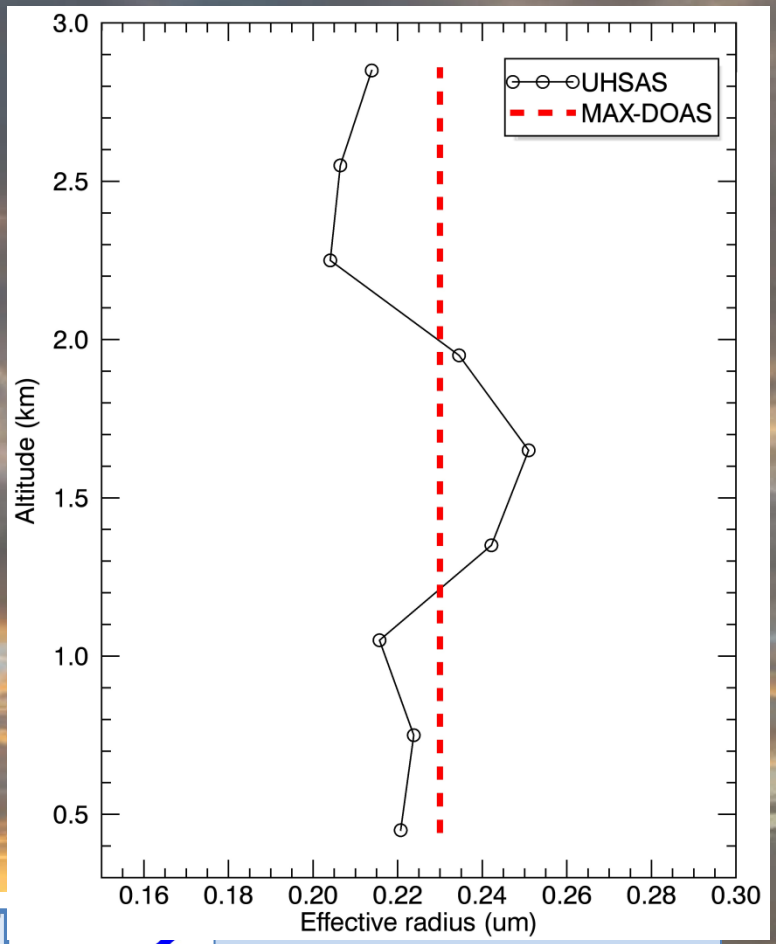
Preliminary first results











Ultra-High Sensitivity Aerosol Spectrometer (UHSAS)- Aerosols in the size range 0.06-1um