



The UV – Aerosol Campaign 2006

Thessaloniki, Greece, July 13-25

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Participants

- Medical University of Innsbruck, AT
- Aristotle University of Thessaloniki, GR
- University of Manchester, UK
- University of Hannover, DE
- Democritus University of Thrace, GR
- Deutsches Zentrum fuer Luft und Raumfahrt, DE
- Norwegian Institute for Air Research, NO

- Paul Scherrer Institut, CH
- Free University Berlin, DE (funded by EUFAR and ACCENT)
- NASA / Goddard Space Flight Center, US (own funding)

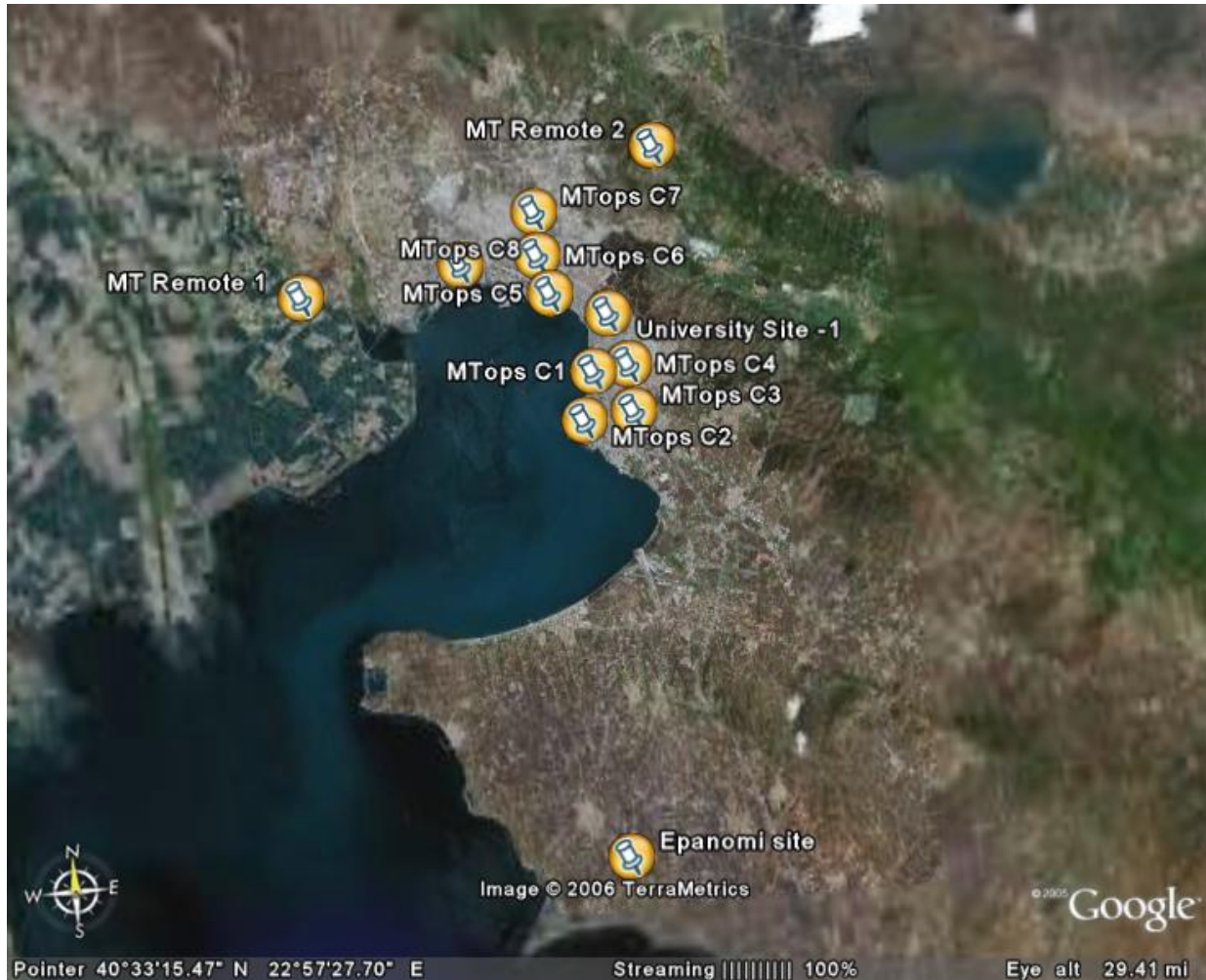
Objectives

- To improve our knowledge on the modulation of UV by aerosols
- To enhance our capability in modeling the effects of aerosols on UV radiation by improved parameterization of their optical properties

Actions towards the objectives

- Exploring methods to derive aerosol optical properties in the UV (spectral optical depth and aerosol single scattering albedo) from radiation measurements and RT modeling
- Validation of retrieved aerosol optical properties with in situ ground and aircraft measurements
- Quantification of the effects of different aerosols on spectral global irradiance and actinic flux density

Measurement sites



Campaign Instrumentation: ground based

UV Radiation

- 7 Scanning spectroradiometers
 - 3 Bentham (DTM300)
 - 4 Brewer (MKIII, MK II, MK IV)
- 1 CCD spectrometer
- 3 PDA spectrometers
- 7 Sun photometers
 - 2 Cimel (Aeronet)
 - 2 Aerosol Microtops
 - 3 Ozone Microtops
- Filter radiometers
 - 1 UVMFR
 - 2 NILU-UV
 - 5 broadband radiometers (shortwave, UV-ery, UV-A)

Aerosols

- Nephelometer:
scattering coef. 450, 550, 700 nm
- Aethalometer:
absorption coeff. 370, 470, 520, 590, 660, 880, 950 nm
- Aerosol sampler
chemical composition
- mass concentration of PM10 and black carbon
- Particle counter:
size distribution (0.3 – 20 μm)
- Raman Lidar:
tropospheric aerosol profile 355, 532 nm

Campaign Instrumentation: airborne

Cessna 310 (Thessaloniki air-club)

- Nephelometer (530 nm)
- Black Carbon photometer (530 nm)
- Filter pack for aerosol collection
- PMS aerosol optical counter
(size distribution in 8 bins between 0.1 and 10 μm)

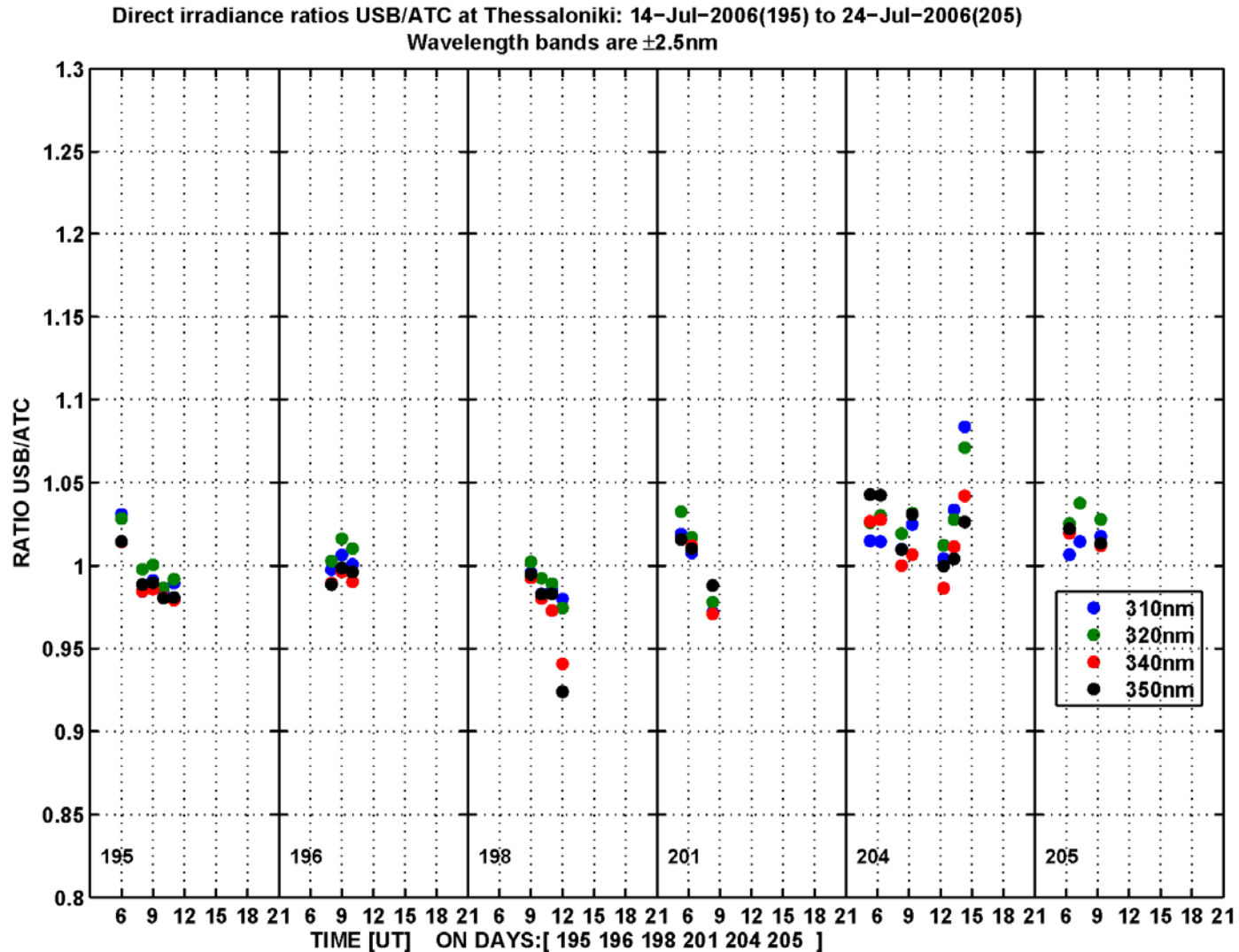


Cessna 207T (FUB – EUFAR/ACCENT)

- Polis Lidar (backscatter coefficient at 355 nm)
- PDA spectrometer (305 – 1150 nm), aureole and sun
- PDA Ocean Optics, 2 channel (up / down)
- Grimm aerosol optical counter
(size distribution in 15 bins)

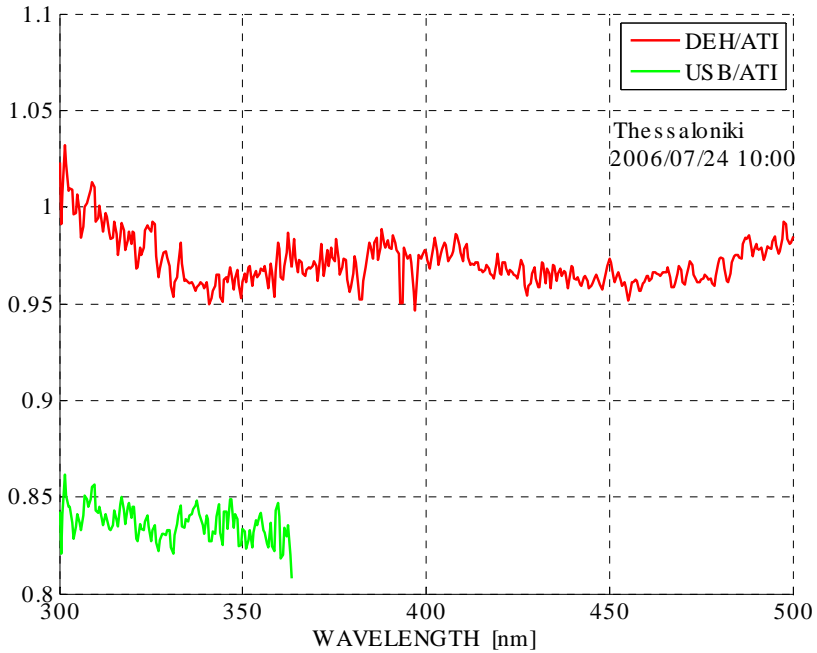


Intercomparison of direct irradiance

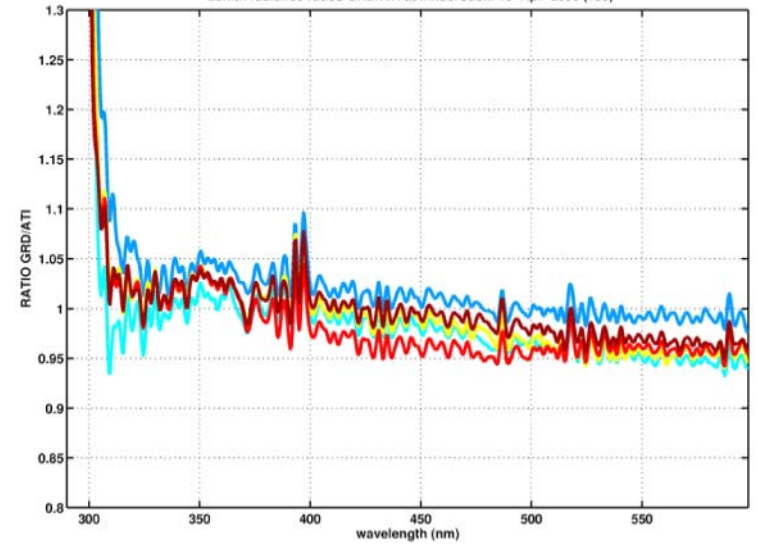


Intercomparison of radiance

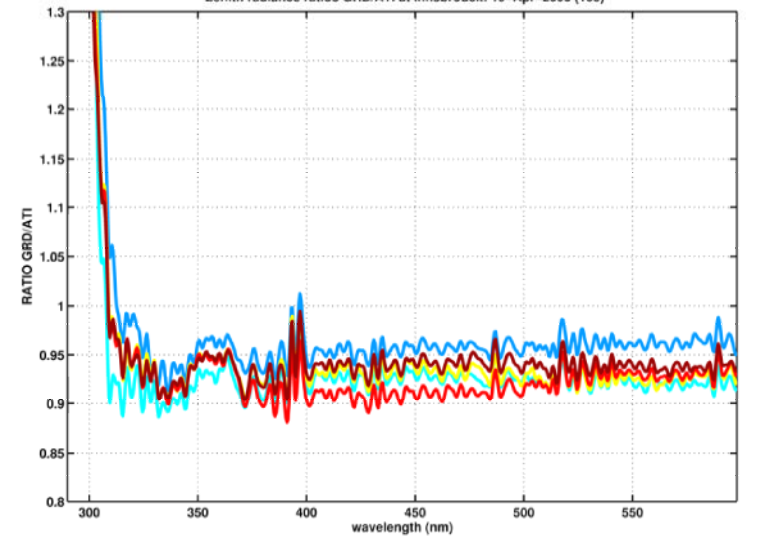
Ratio of zenith radiances



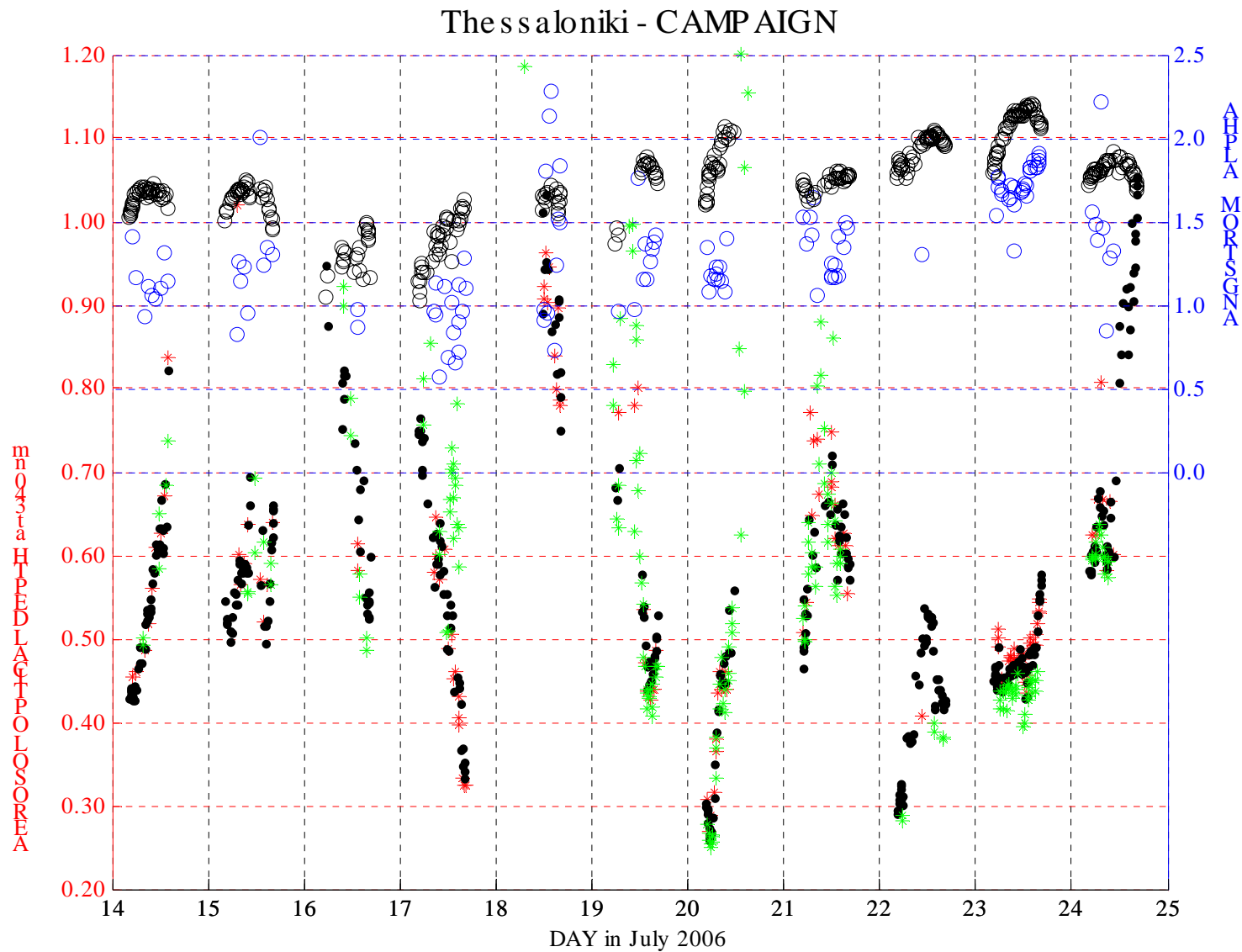
Zenith radiance ratios GRD/ATI at Innsbrouck: 15-Apr-2006 (105)



Zenith radiance ratios GRD/ATI at Innsbrouck: 19-Apr-2006 (109)

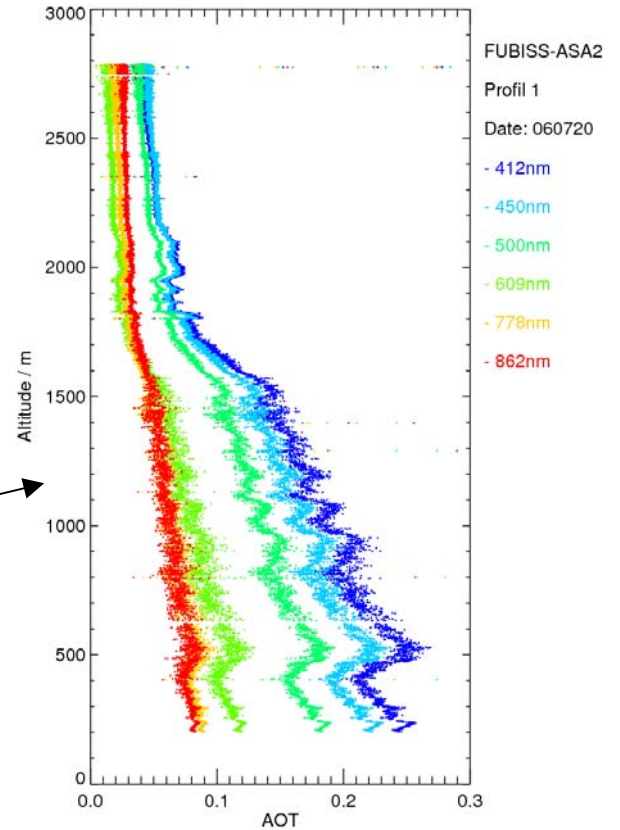
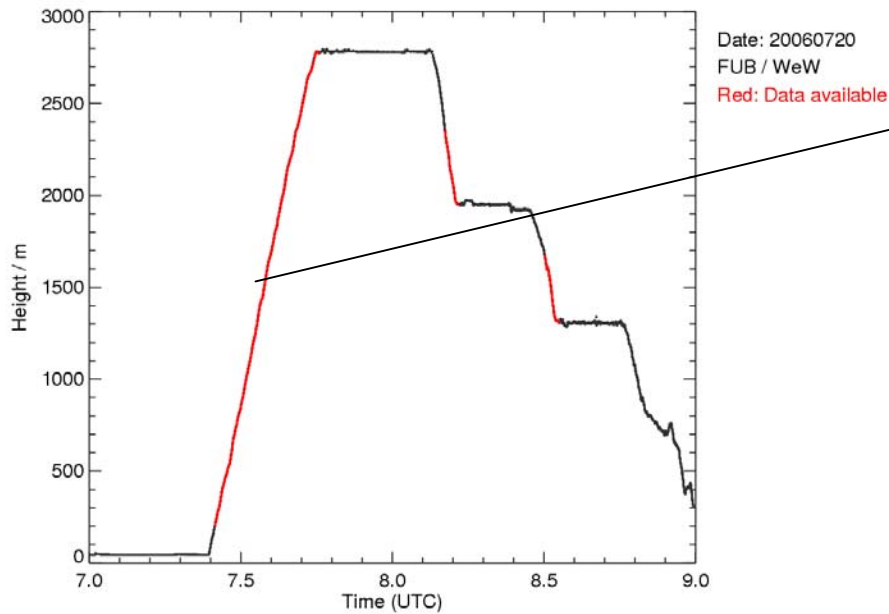


Aerosol optical depth



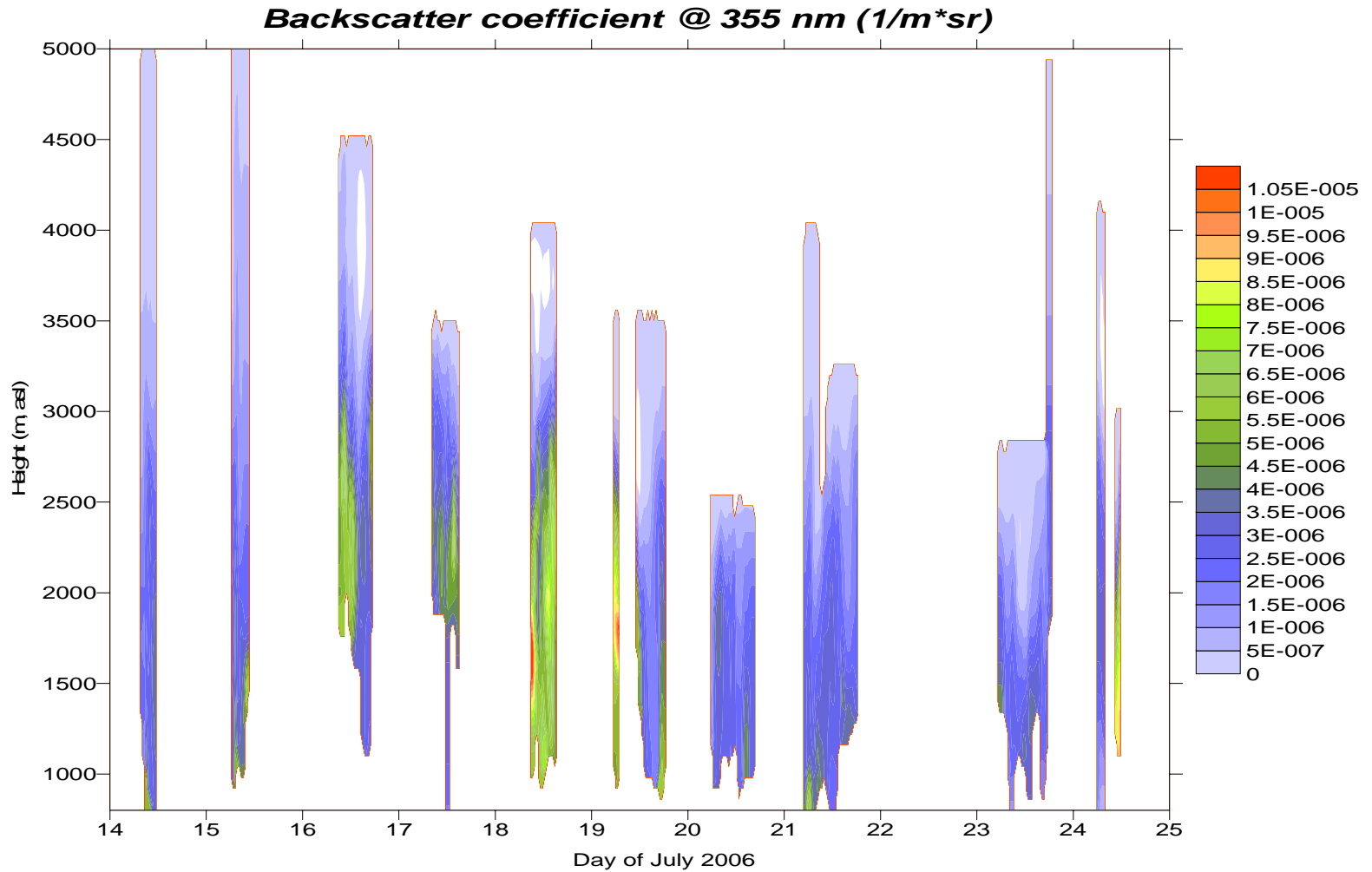
Sunphotometer: aircraft (FUB)

aerosol optical thickness
spectral channels 412 nm, 450 nm,
500 nm, 609 nm, 778 nm, 862 nm



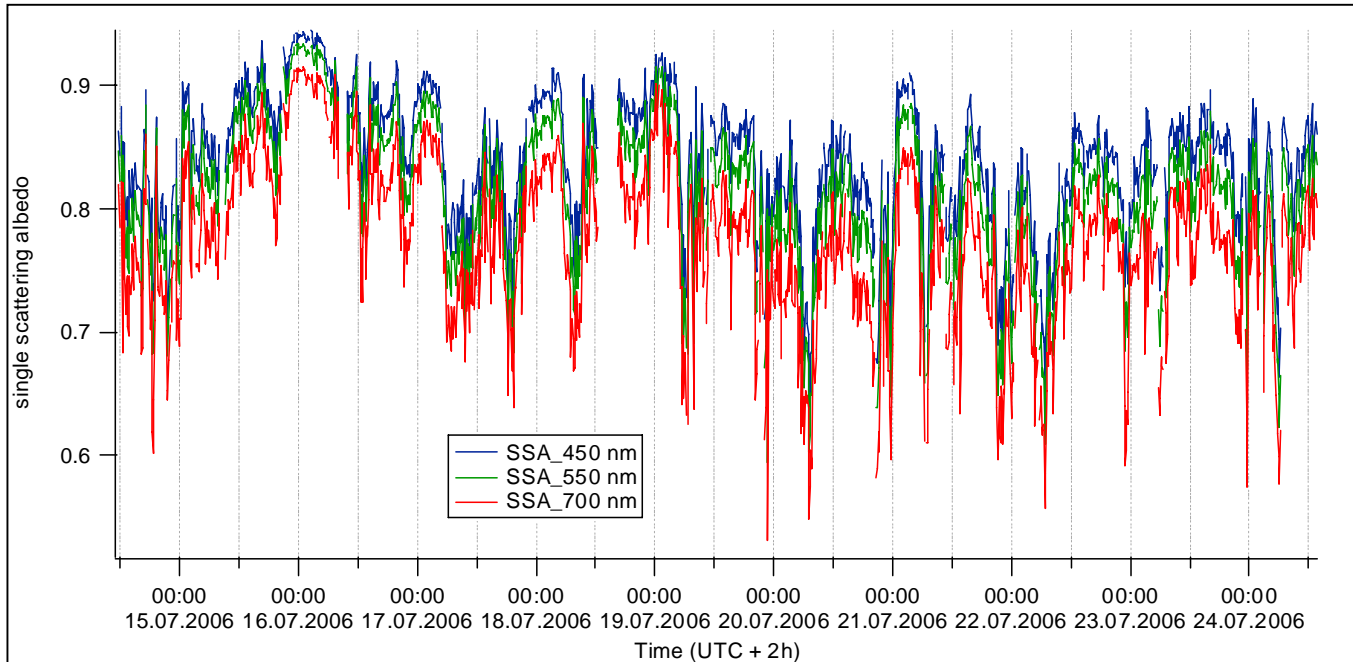
from: Ruhtz et al.

Lidar measurements: ground



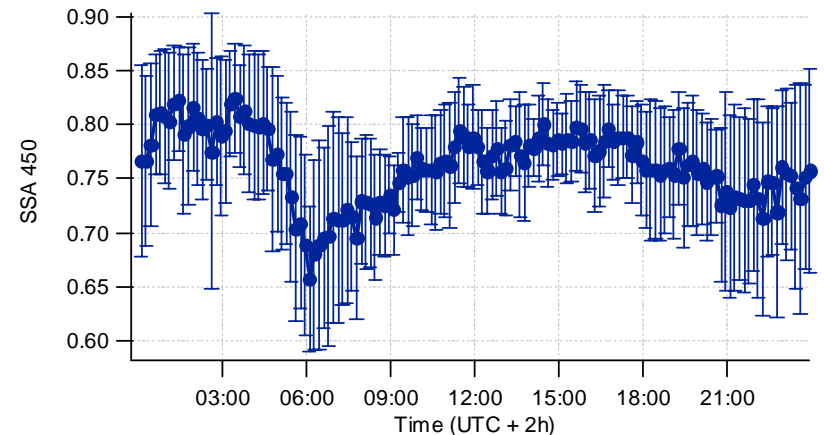
from: Balis et al.

SSA near the surface (PSI data)

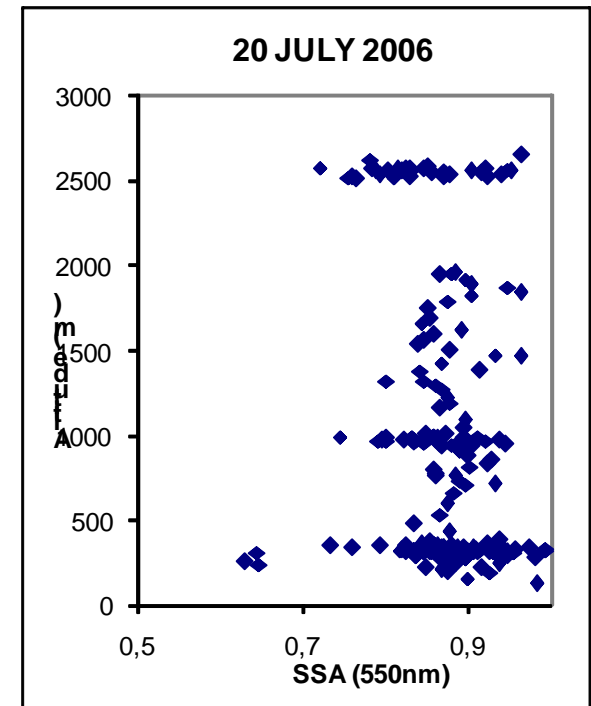
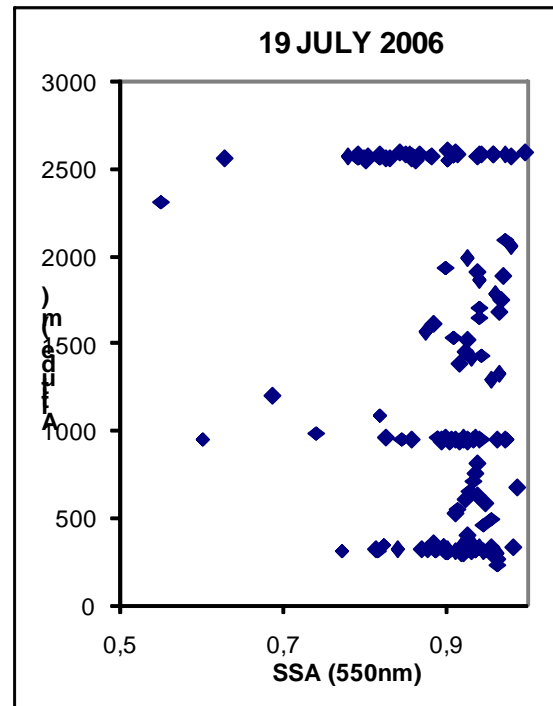
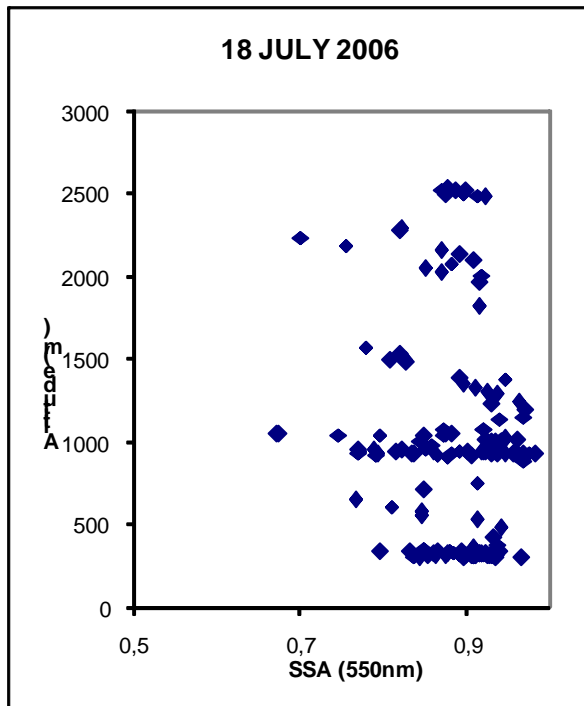


from Nephelometer and
Aethalometer (ground)

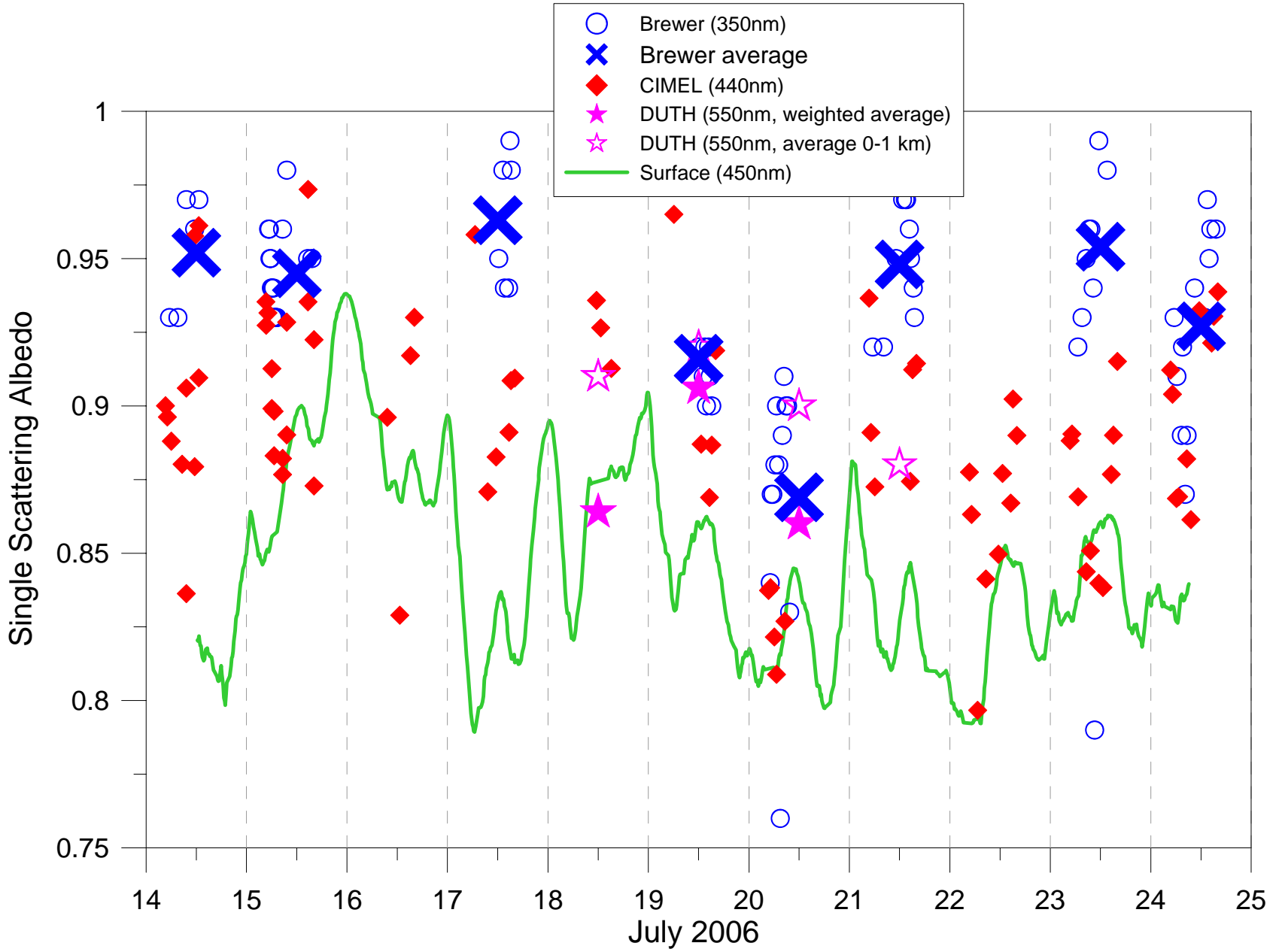
from: Schmidhauser et al.



Single Scattering Albedo: aircraft (DUTH)

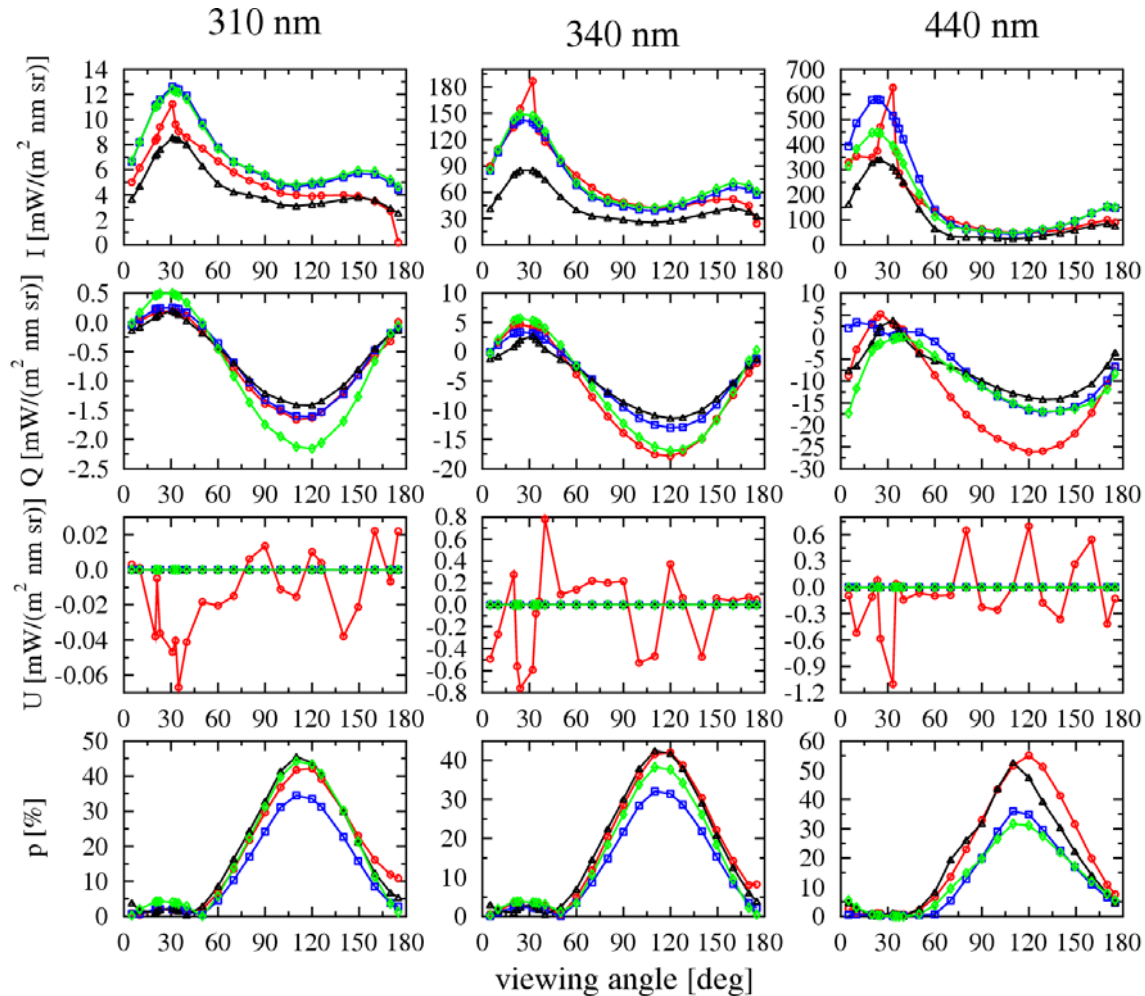


from: Rapsomanikis et al.



from: AUTH.

Sky radiance and polarization – measurements and modelling



from: Emde et al.

6 posters:

- No. 15: *SCOUT-O3 aerosol campaign: Temporal and spatial variations of aerosols at Thessaloniki, Greece.* Kazadzis S. et al.
- No. 17: *The aerosol single scattering albedo during the SCOUT-O3 Aerosol - UV radiation campaign.* Kazantzidis A. et al.
- No. 19: *Study of the variability of the aerosol properties during SCOUT-O3 campaign using lidar measurements and in-situ aircraft data.* Balis D. et al.
- No. 21: *Airborne measurements of aerosol optical properties during SCOUT-O3.* Ruhtz T. et al.
- No. 22: *Vertical distribution of aerosols during the SCOUT-O3 campaign using airborne lidar measurements.* Wiegner M. et al.:
- No. 25: *Ground based measurements of scattering and absorption coefficients at Thessaloniki.* Schmidhauser R. et al.