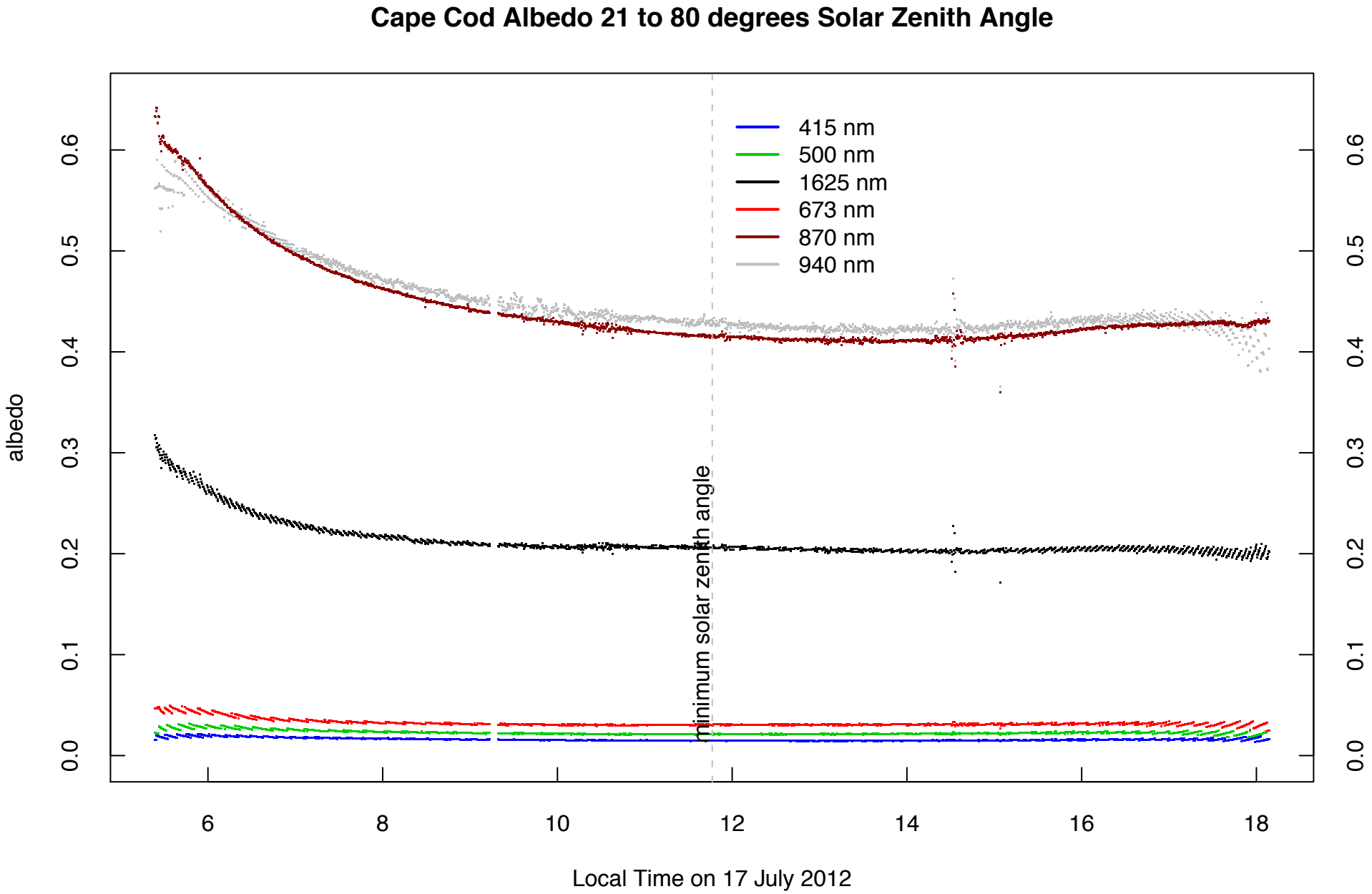
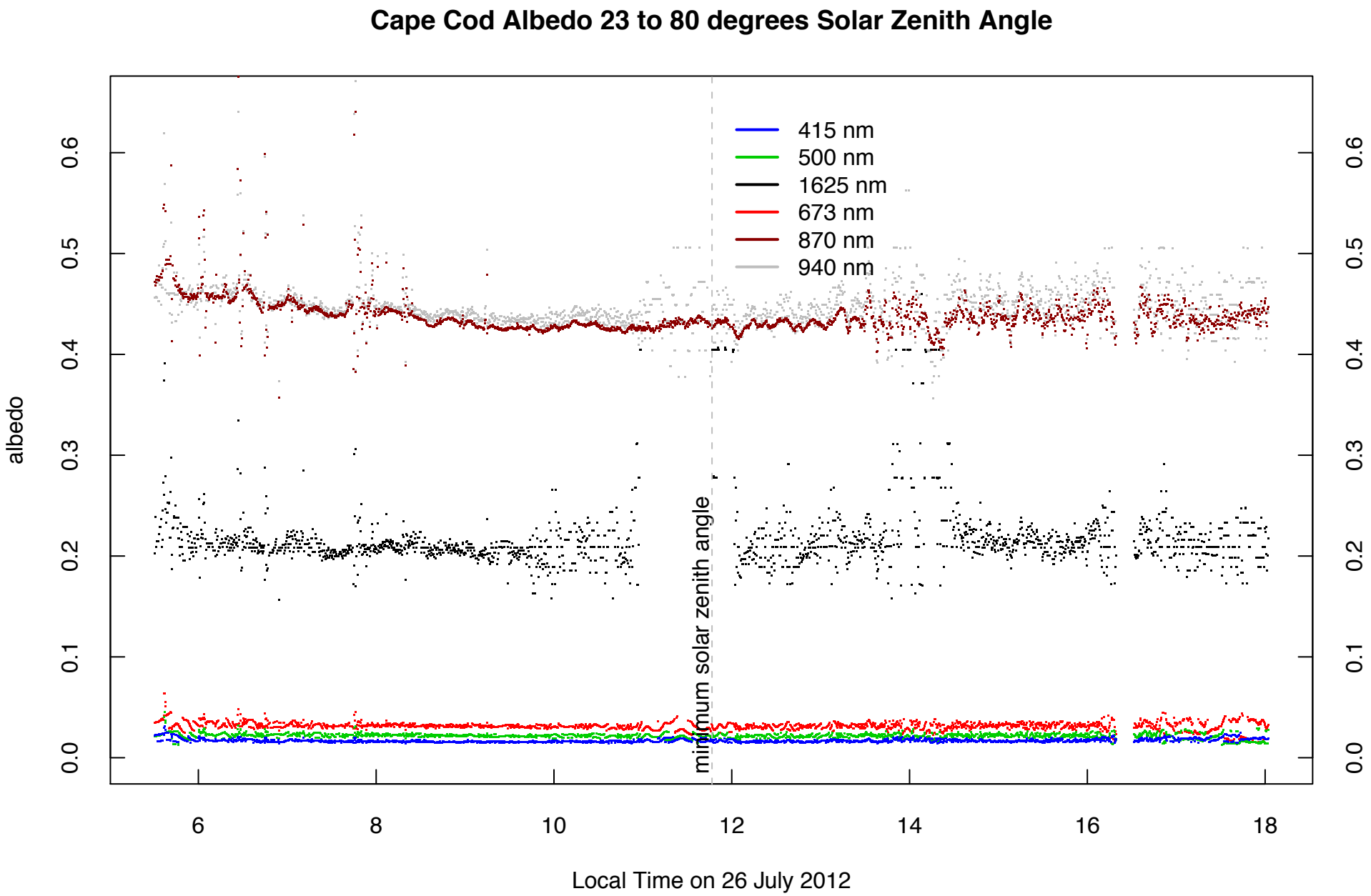
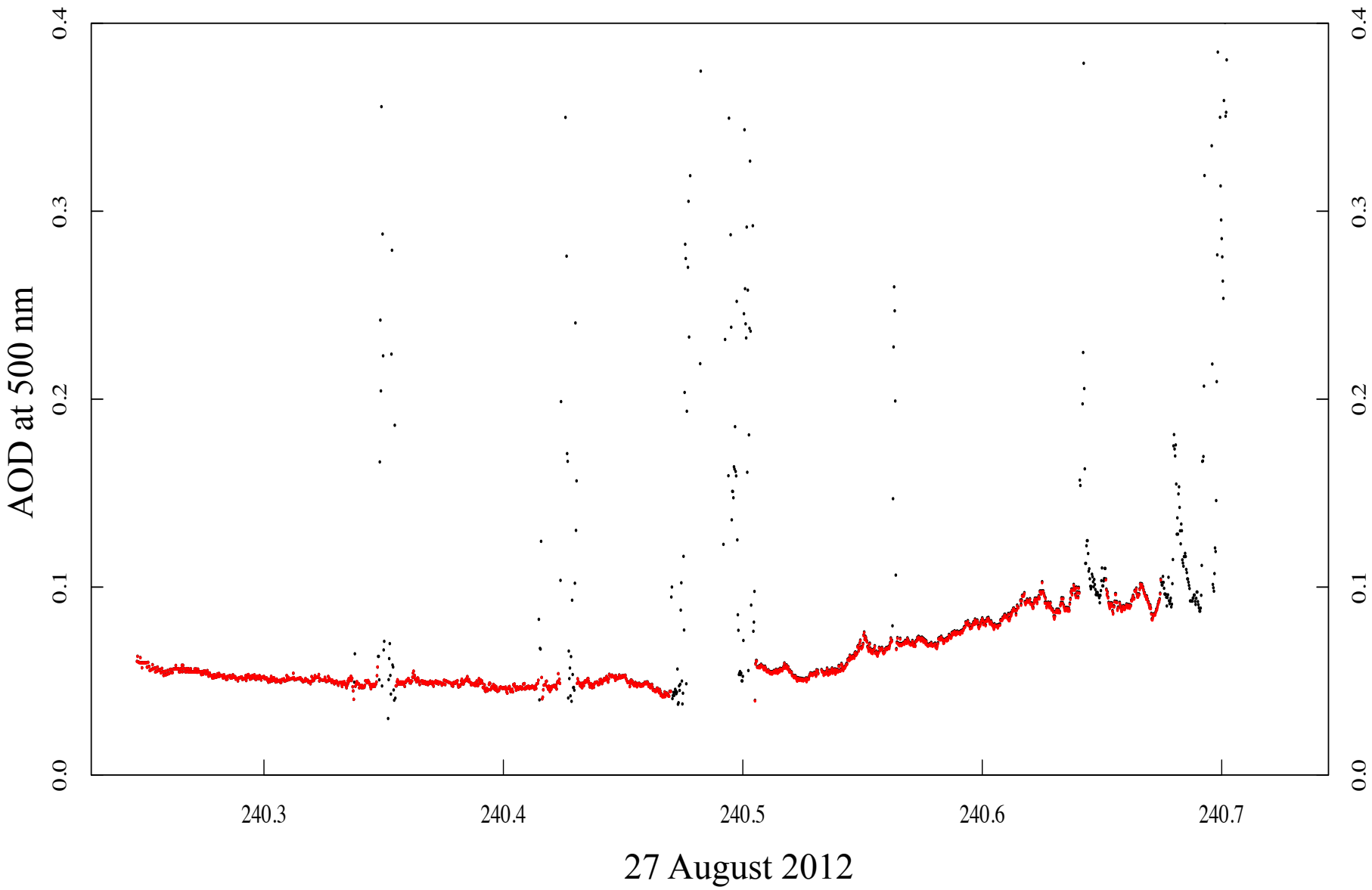
Aerosol Optical Depth (AOD) and Spectral Albedo (9 July to 6 September)

Kathy Lantz[1], Gary Hodges[1], and Joe Michalsky[2]
[1]CIRES, University of Colorado and [2]NOAA/ESRL


MFR
MFRSR
42.0305n,70.0494w

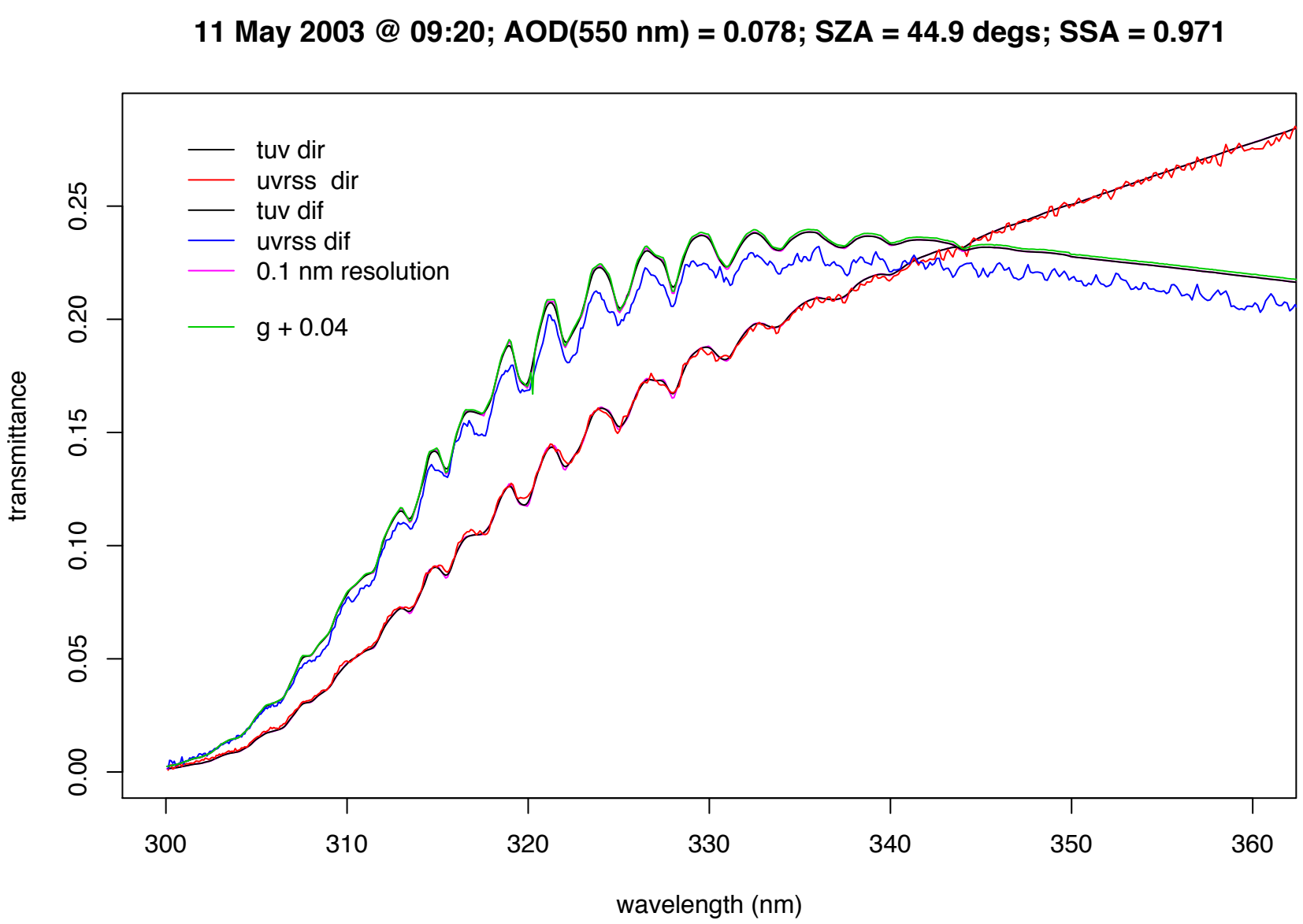

Cape Cod Albedo 21 to 80 degrees Solar Zenith Angle
albedo
0.0
0.1
0.2
0.3
0.4
0.5
0.6
415 nm
500 nm
1625 nm
673 nm
870 nm
940 nm
minimum solar zenith angle
6
8
10
12
14
16
18
Local Time on 17 July 2012

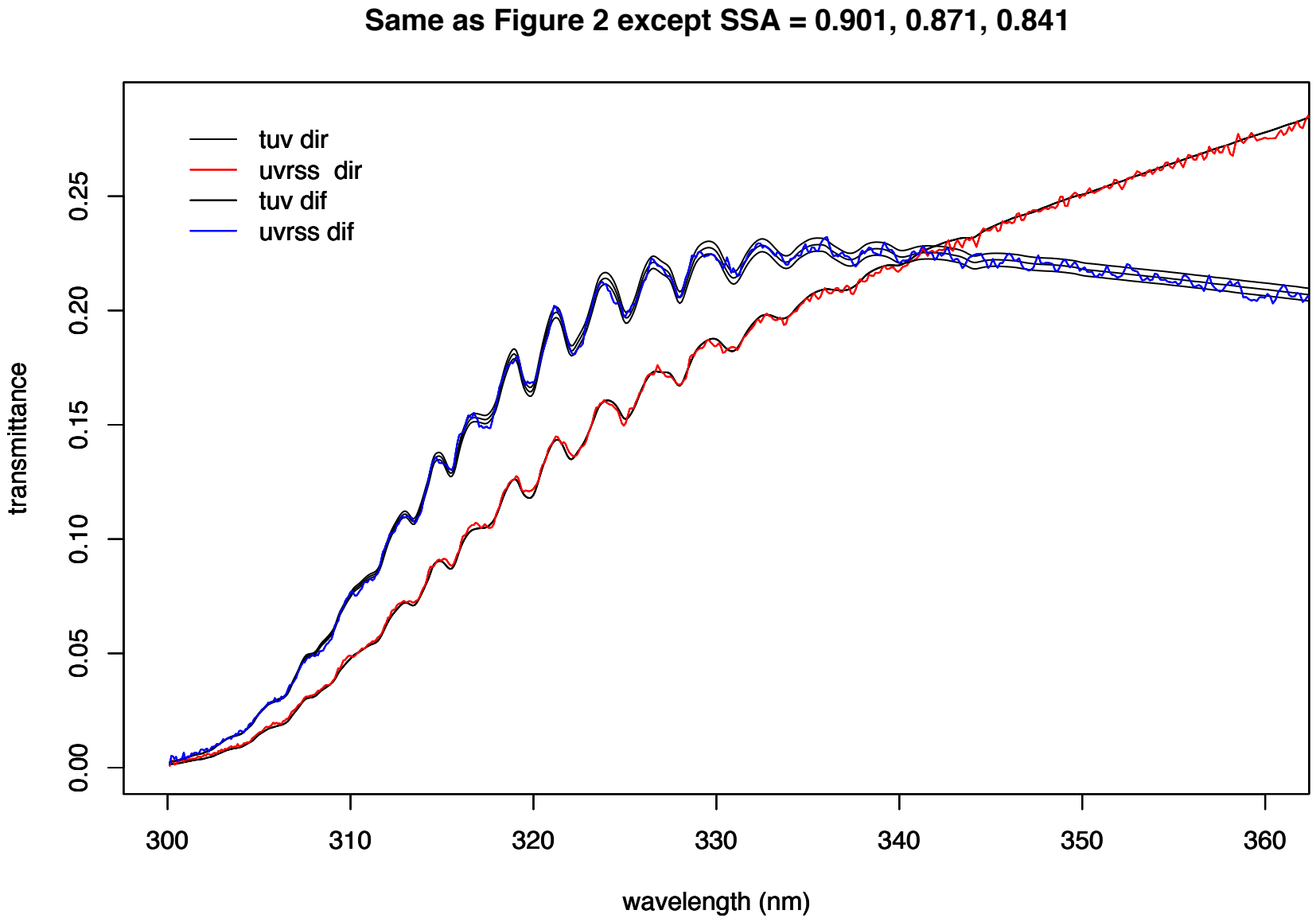

Cape Cod Albedo 23 to 80 degrees Solar Zenith Angle
415 nm
500 nm
1625 nm
673 nm
870 nm
940 nm
albedo
0.0
0.1
0.2
0.3
0.4
0.5
0.6
minimum solar zenith angle
6
8
10
12
14
16
18
Local Time on 26 July 2012


AOD at 500 nm
0.0
0.1
0.2
0.3
0.4
240.3
240.4
240.5
240.6
240.7
27 August 2012

Single Scattering Albedo Retrieval from MFRSR

- Compare modeled and measured diffuse and direct transmission
- Direct transmission depends on Rayleigh scattering, ozone absorption, and aerosol extinction
- Diffuse also depends on surface albedo, asymmetry parameter, and single scattering albedo


11 May 2003 @ 09:20; AOD(550 nm) = 0.078; SZA = 44.9 degs; SSA = 0.971
tuv dir
uvrss dir
tuv dif
uvrss dif
0.1 nm resolution
g + 0.04
transmittance
0.00
0.05
0.10
0.15
0.20
0.25
300
310
320
330
340
350
360
wavelength (nm)


Same as Figure 2 except SSA = 0.901, 0.871, 0.841
tuv dir
uvrss dir
tuv dif
uvrss dif
transmittance
0.00
0.05
0.10
0.15
0.20
0.25
300
310
320
330
340
350
360
wavelength (nm)

Summary

- The additional 1623 nm band will allow better characterization of coarse mode in ambient conditions that will get better asymmetry parameter
- With this and surface albedo will get ambient SSA @ 5 wavelengths
- And this will work in very low AOD conditions (down to at least 0.10)