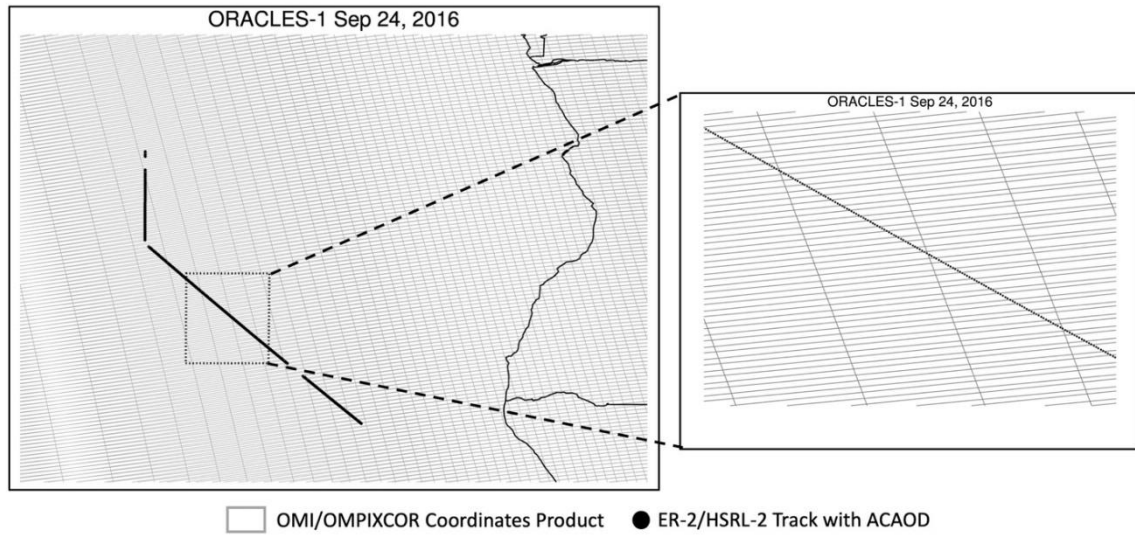
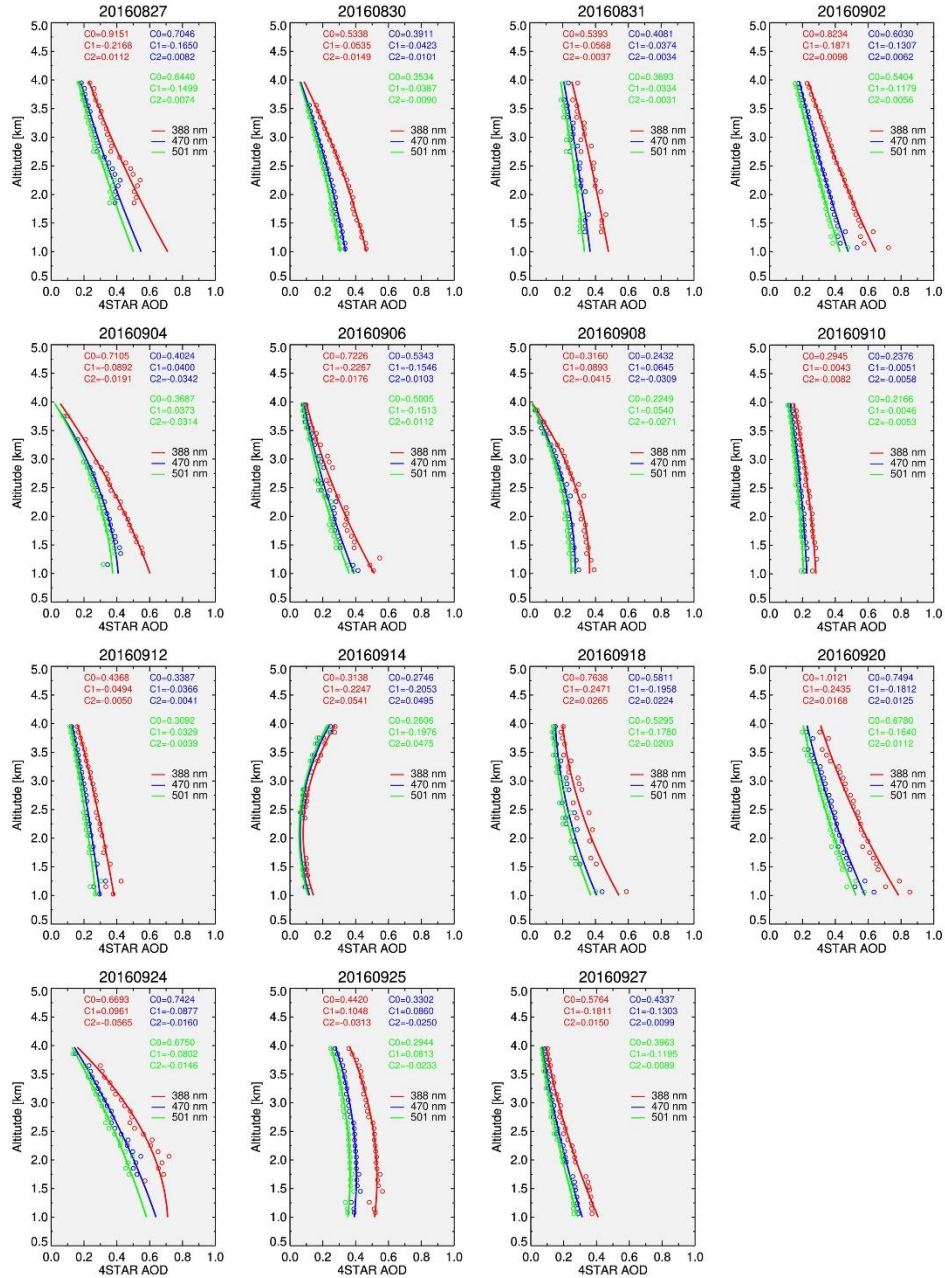
Retrieving UV-VIS Spectral Single-scattering Albedo of Absorbing Aerosols above Clouds from Synergy of ORACLES Airborne and A-train Sensors

Hiren T Jethva[1,2], Omar Torres[2], Richard Anthony Ferrare[3], Sharon P Burton[3], Anthony L Cook[3], David B Harper[3], Chris A Hostetler[3], Jens Redemann[4], Vinay Kayetha[5], Samuel LeBlanc[6], Kristina Pistone[6], Logan Mitchell[4], Connor J Flynn[4]

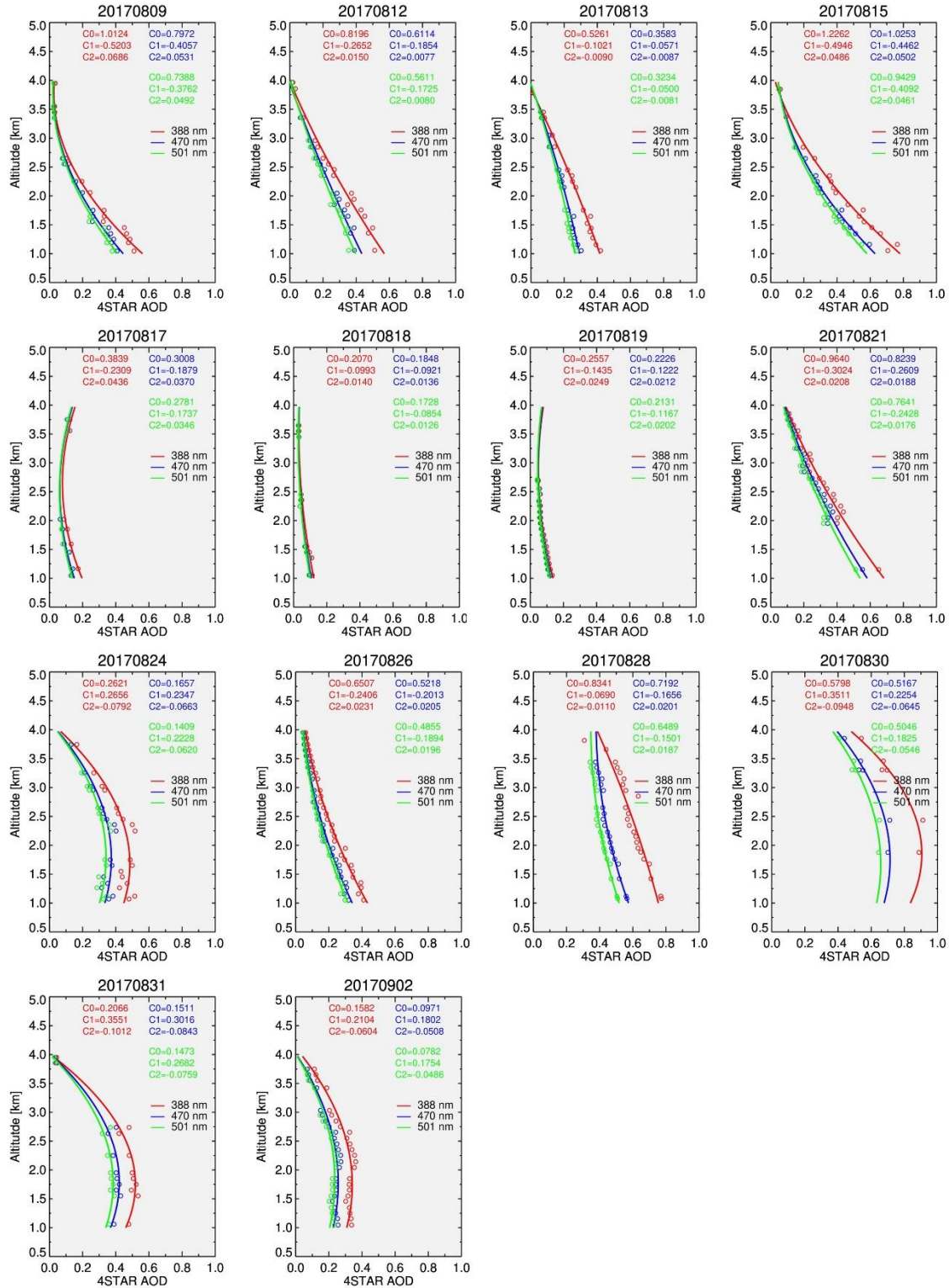
[1]Morgan State University, Baltimore, MD, United States
[2]NASA Goddard Space Flight Center, Greenbelt, MD, United States
[3]NASA Langley Research Center, Hampton, VA, United States
[4]University of Oklahoma, Norman, OK, United States
[5]Science Systems and Applications, Inc., Lanham, MD, United States
[6]Bay Area Environmental Research Institute, Moffett Field, CA, United States

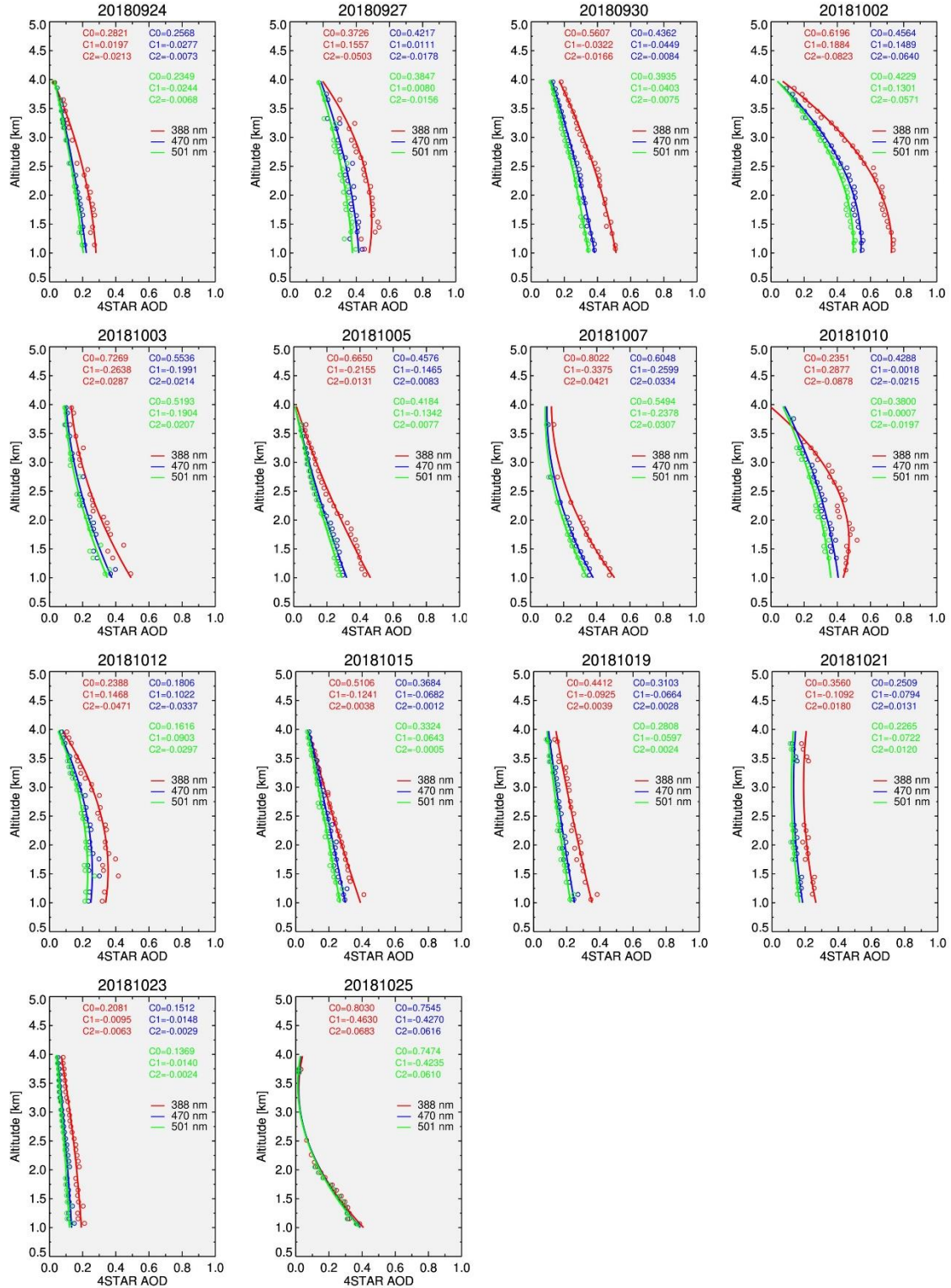
Correspondence to: Hiren Jethva (hiren.t.jethva@nasa.gov)

Supplementary File

20

Supplementary Figure 1. Collocation of HSRL-2 measurements of ACAOD (dark filled circle) with the Aura/OMI pixel polygons (grey boxes) obtained from the OMPIXCOR FoV75 pixel corner coordinate product for the ER-2 flight operated on Sep 24, 2016 over the southeastern Atlantic Ocean.

30

Supplementary Figure 2. Altitude-averaged vertical profiles (colored circles) of spectral AOD at 388 nm (red), 470 nm (blue), and 501 nm (green) wavelengths above the aircraft measured by 4STAR Sunphotometer onboard P3-Orion flights operated during the ORACLES-1 September 2016 deployment. AOD measurements were aggregated for each altitude grid of size 0.1 km between 1.0 km and 4.0 km to derive an average vertical profile and associated altitude

35 versus AOD quadratic polynomial. Coefficients of fitted quadratic relation for the three wavelengths are printed within each plot.

Supplementary Figure 3 Same as in supplemental Figure 2 but for 4STAR/P3-Orion flights operated during the

40   ORACLES-2 August 2017 deployment.

Supplementary Figure 4 Same as in supplemental Figure 2 but for 4STAR/P3-Orion flights operated during the ORACLES-3 October 2018 deployment.