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Ground-based MFRSR UV-Vis spectral retrievals of Saharan dust absorption at Izaña Observatory

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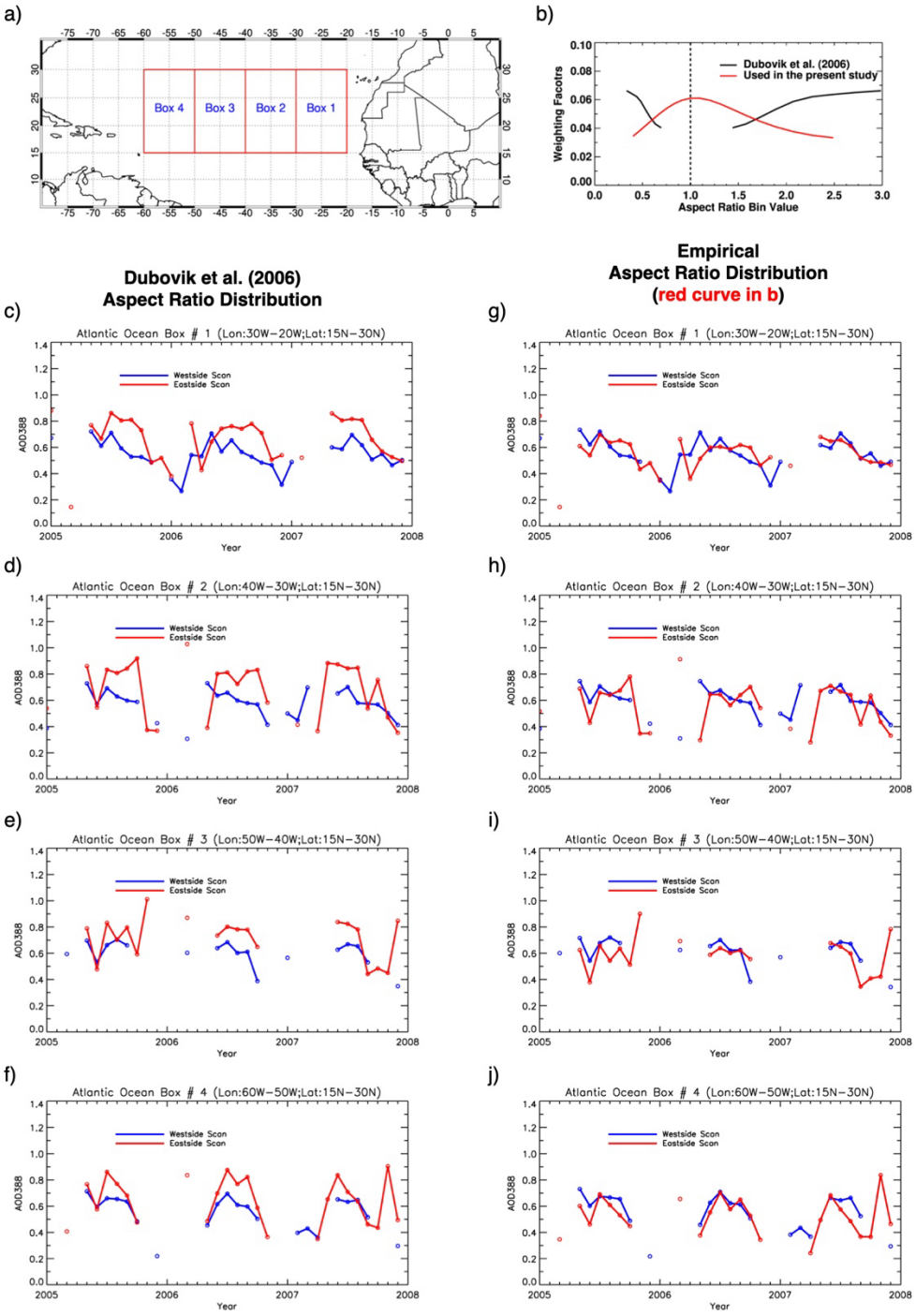

Figure S1 OMI monthly aerosol optical depth [388 nm] timeseries in different regional boxes (1 through 4) over the Atlantic Ocean, as shown in a), retrieved assuming original dust aspect ratio distribution proposed in Dubovik et al. (2006) (c through f) and empirically derived distribution (g through j). The respective aspect ratio distributions as a function of axis ratio are shown as black and red curve in b). OMI AOD retrieval data are shown separately for eastside (red lines) and westside (blue lines). Use of empirically derived aspect ratio distribution (red curve) in the OMI near-UV aerosol algorithm demonstrate closer agreement between west and east sides of the scan.

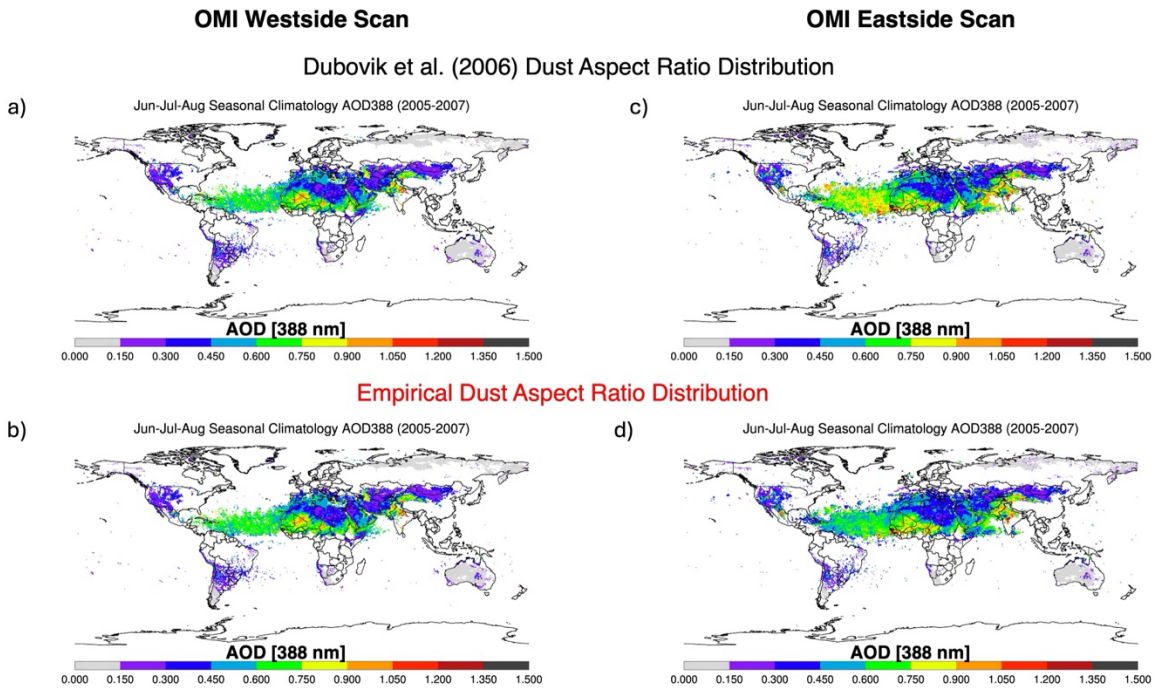

Figure S2 Summertime (June-July-August) global distribution of OMI-retrieved dust aerosol optical depth [388 nm] derived using data collected over the westside (a, b) and eastside (c, d) of the OMI scan. Dust AOD inversions over ocean were carried out assuming spheroidal aspect ratio distribution suggested in Dubovik et al. (2006) (a, b, black curve in Supplementary Figure 1) and empirically derived distribution (b, d, red curve in Supplementary Figure 2). Dust AOD over land was derived assuming spheroidal aspect ratio distribution (Dubovik et al., 2006).

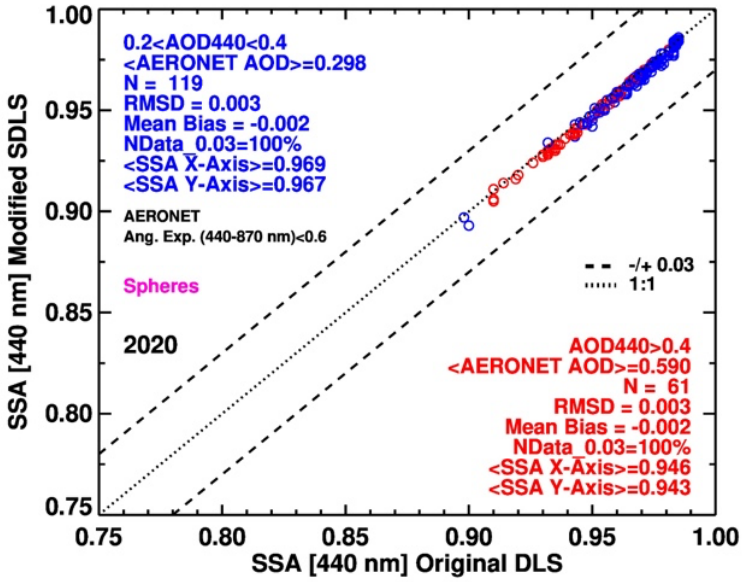

Figure S3 Comparison of SSA440 derived using refactored DLS (originally called SDLS or the API in this work) (y-axis) and Original DLS (x-axis) software tools. Synthetic downwelling surface diffuse-to-direct ratio simulated using 2020 AERONET Level 1.5 measurements were used. The dust aerosols were treated as spherical particles in both simulations.