Supplementary document for "Mid-level clouds are frequent above the southeast Atlantic stratocumulus clouds"

Adeyemi A. Adebiyi[1], Paquita Zuidema[2], Ian Chang[3], and Sharon P Burton[4]

[1]Department of Atmospheric and Oceanic Sciences, University of California Los Angeles.

[2]Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, FL.

[3]School of Meteorology, University of Oklahoma, Norman, OK

[4]NASA Langley Research Center, Hampton, Virginia 23681, USA

Correspondence to: Adeyemi A. Adebiyi (aadebiy@ucla.edu)
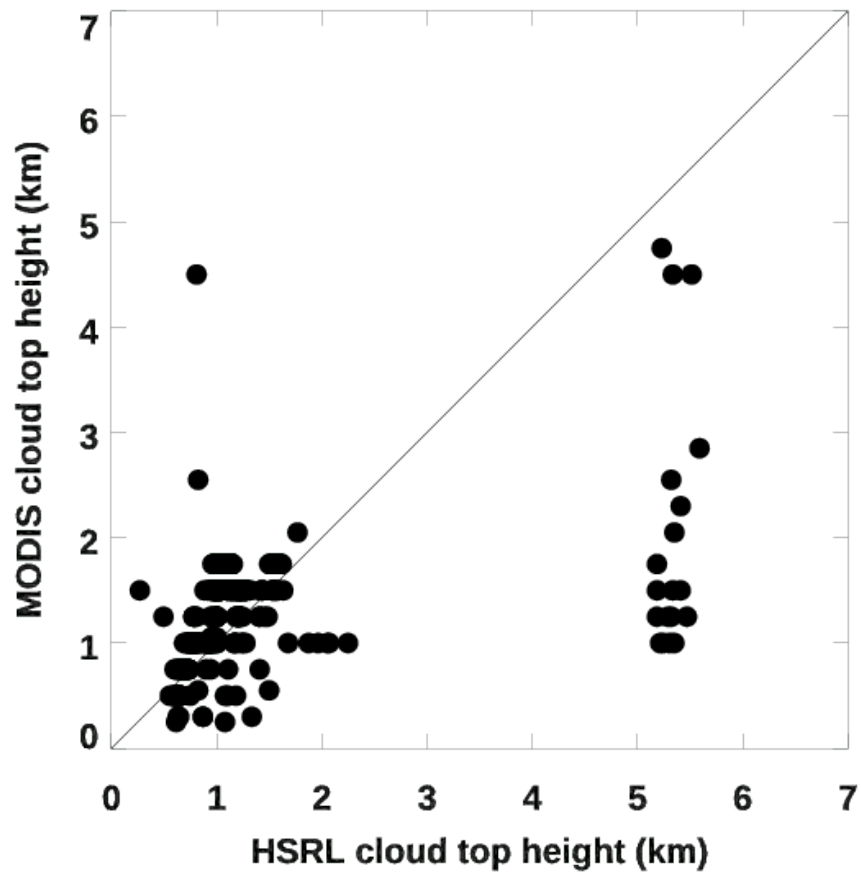
Figure S- 1: Similar to Fig. 2b. Scatterplot showing MODIS cloud top height as a function of HSRL cloud top height during ORACLES 2016 collocated within +/- 15 minutes.
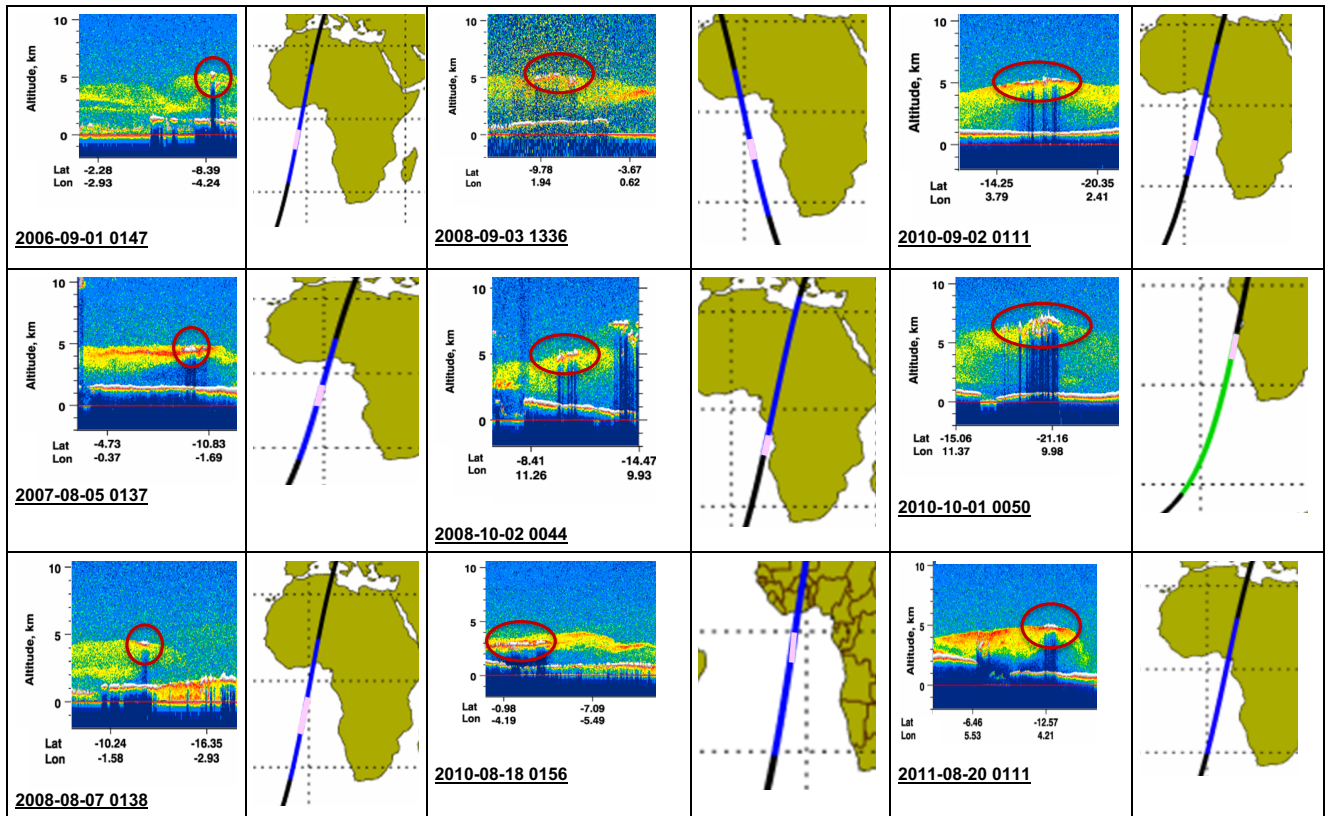
Figure S- 2: Similar to Fig. 1a, examples from CALIPSO showing CALIOP 532-nm total attenuated backscatter (km−1 sr−1) with identifiable mid-level clouds, smoke, and/or low-level clouds. The mid-level clouds are highlighted with red circular shape, while the geographical location is shown in the adjacent map identified by pink shaded region on the blue- or green-colored CALIPSO overpass.
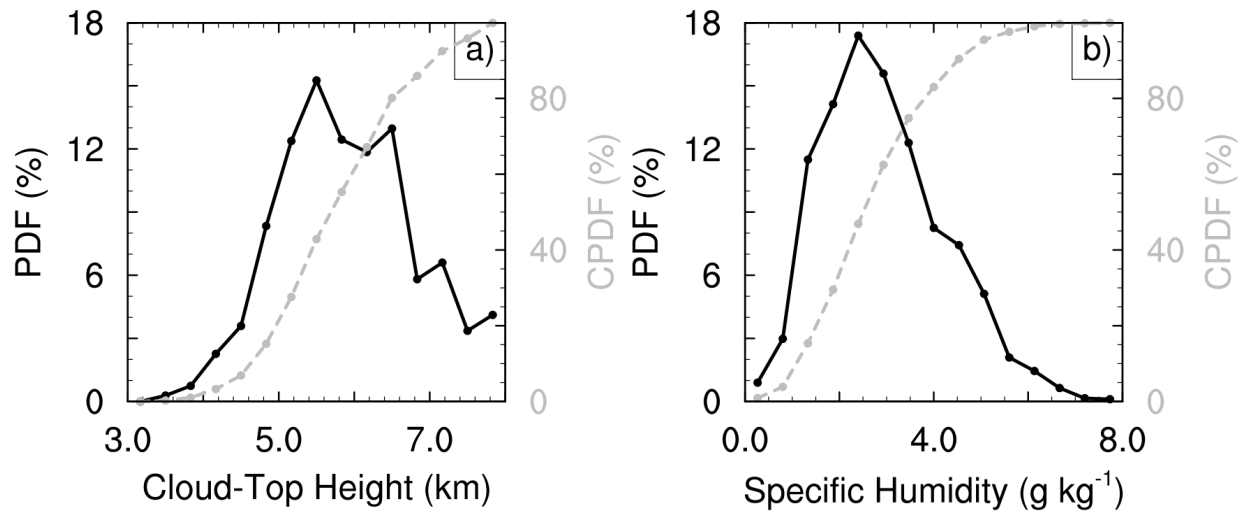
Figure S- 3: As in Fig. 4a-c, but for (a) cloud-top heights, (b) specific humidity and of mid-level clouds over southeast Atlantic obtained from the merged CloudSat-CALIPSO datasets.
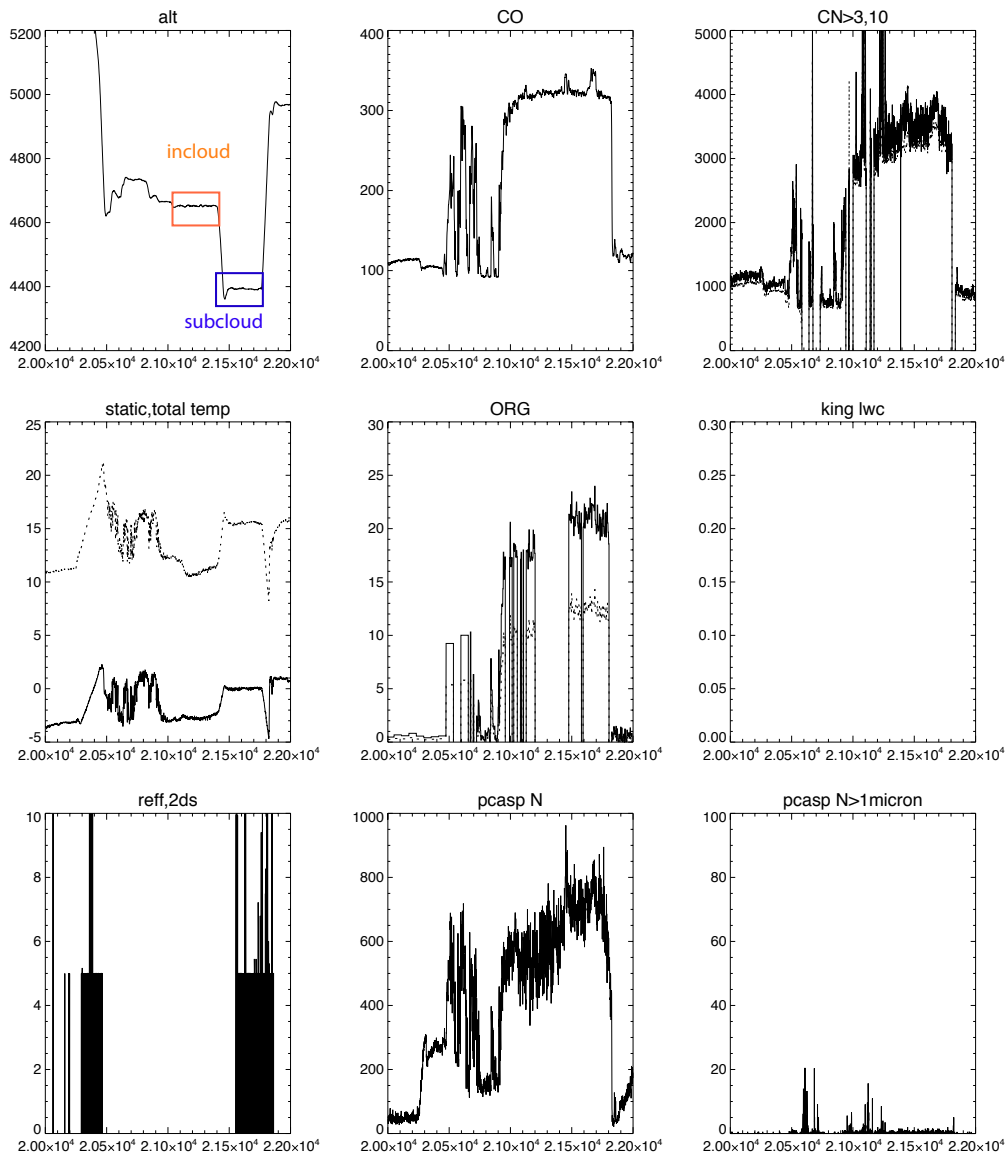
Figure S- 4: In-situ characterization of mid-level clouds measured during ORACLES aboard the P-3 aircraft on 4 September, 2016.
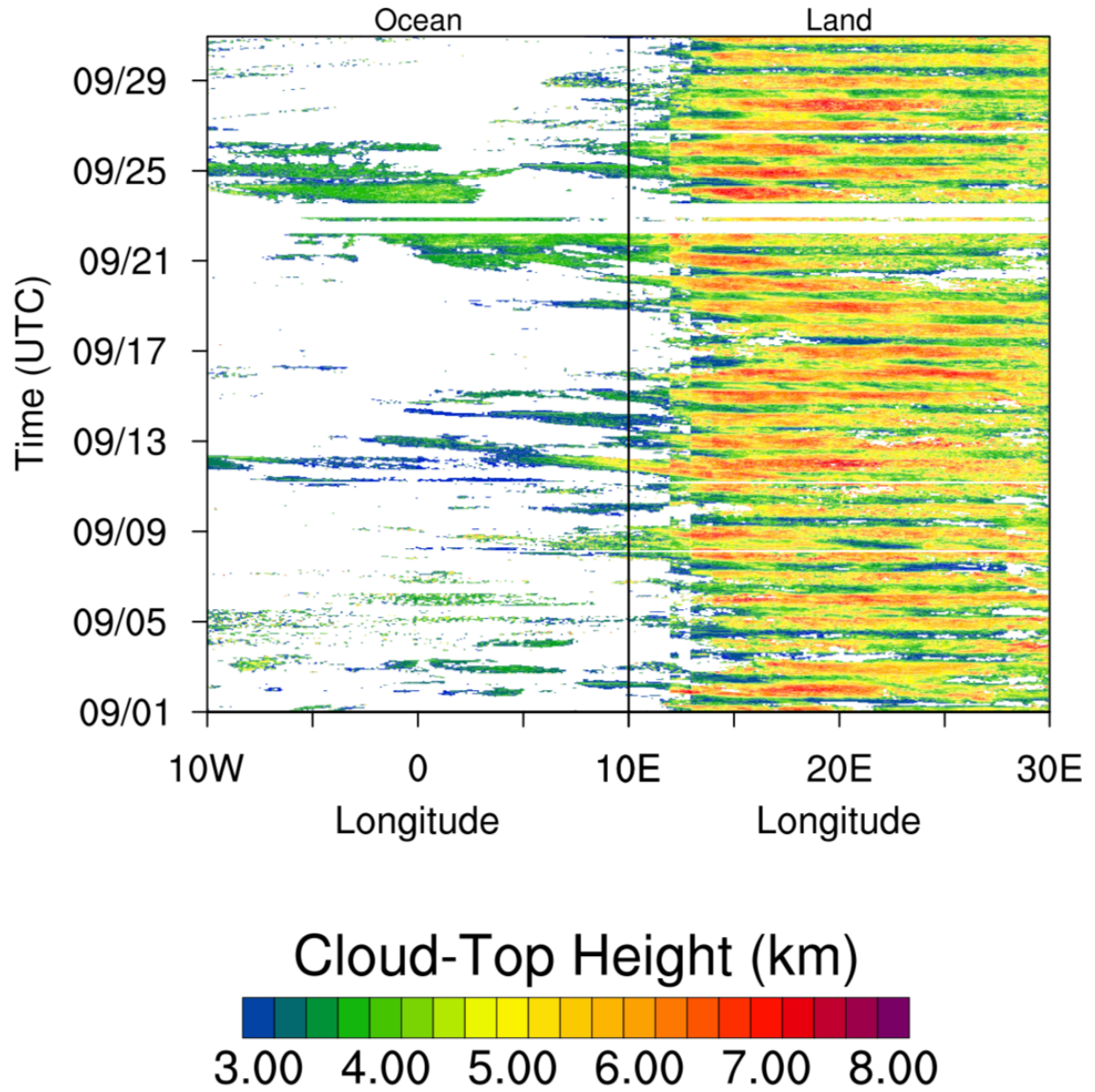
Figure S- 5: Showing the longitude-time cross-section of the mid-level cloud-top heights (km) at hourly resolution between 3–8 km and latitude range of 5ºS-20ºS for 01-30 September 2016.
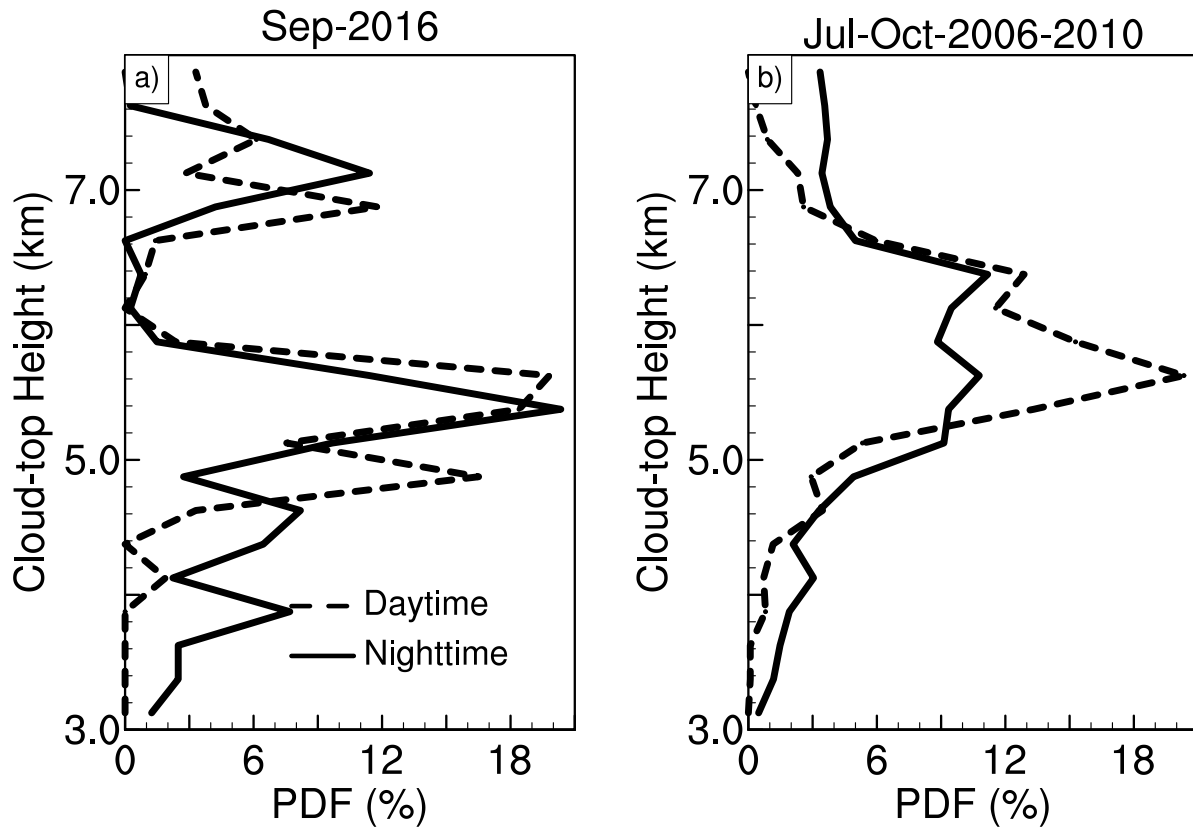
Figure S- 6: The probability distribution of mid-level cloud-top heights (km) obtained from CALIOP for night time (solid line; overpass typically between 00:30 and 01:30 UTC) and daytime (dashed lines; overpass typically between 12:30 and 13:30 UTC) for (a) September 2016 and for (b) July-October 2006-2010.