Figure S1. CALIPSO tracks with stratospheric layers classified as sulfates from July to September 2019. The concentric black dashed circles denote regions of 50, 100, 150km from the location of THELISYS.

Figure S2. CALIPSO observations of the stratospheric AOD (at 532 nm) between 1 July and 20 September 2019 during day and night-time CALIPSO overpasses. The red dot corresponds to the location of THELISYS.

Figure S3. OMPS LP orbital track colored by the stratospheric aerosol optical depth (sAOD) x 10^{-3} at 997 nm measured on 25 July 2019 near Thessaloniki. The red cross denotes the location of Thessaloniki.

Figure S4. CALIPSO orbits during day and night over the domain under study on 25 July 2019. The red dot indicates the location of the THELISYS ground-based lidar.