

Supporting Information for ”Ship-based lidar evaluation of Southern Ocean low clouds in the storm-resolving general circulation model ICON and the ERA5 and MERRA-2 reanalyses”

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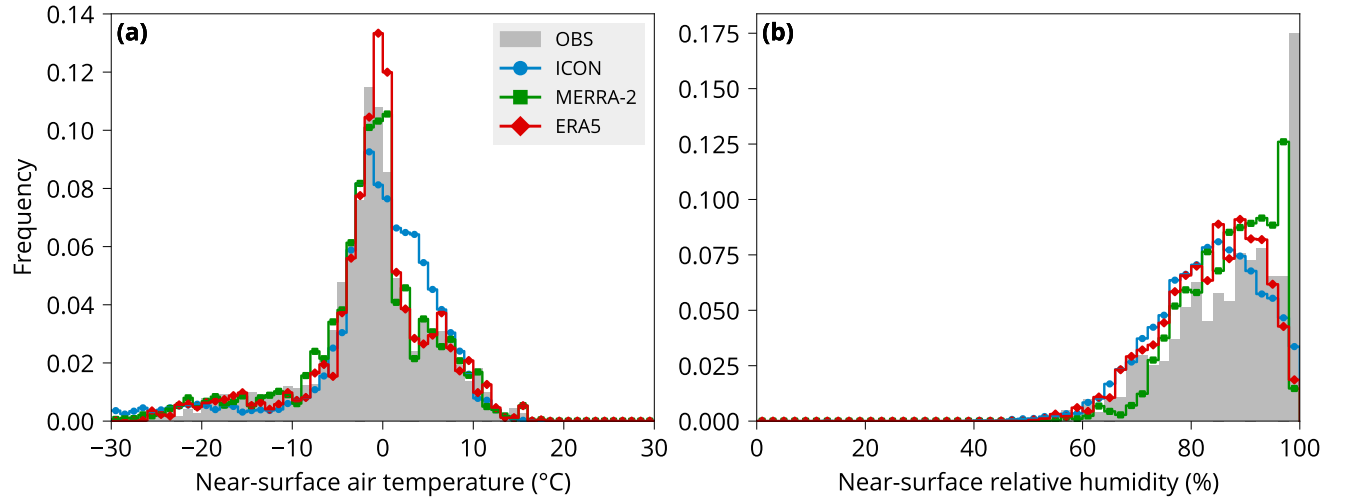


Figure S1. Histograms of near-surface (a) air temperature and (b) relative humidity at radiosonde launch locations in the observations and the corresponding locations and times in the models. Only locations south of 40°S are included.

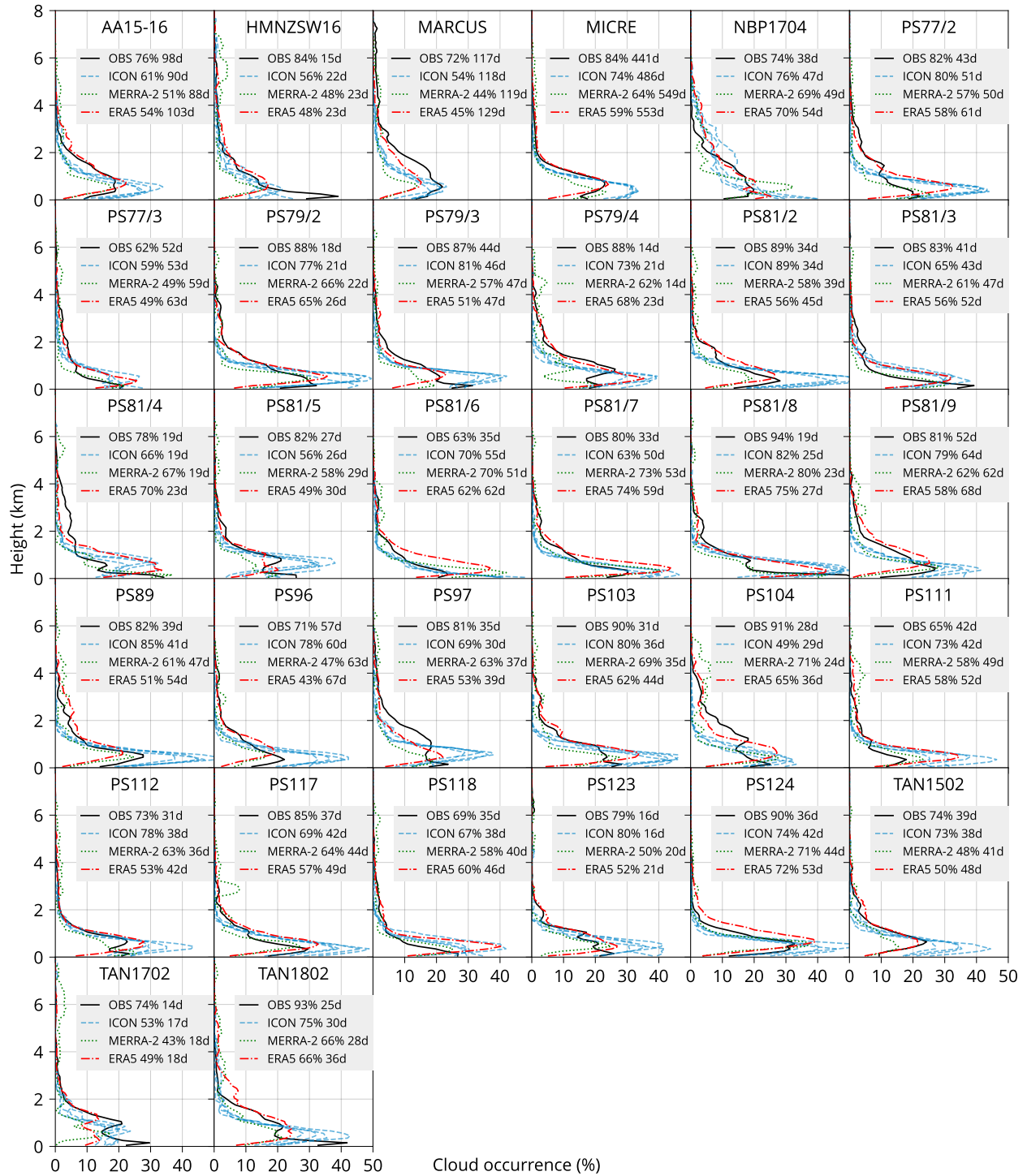


Figure S2. Cloud occurrence by height for the 31 voyages and one sub-Antarctic station (MICRE) in observations (O) and simulated by the ALCF from the ICON model (I), MERRA-2 (M), and ERA5 reanalysis data (E). The numbers in the legend indicate the total cloud fraction and the number of days of data. Multiple lines of ICON profiles are for each of the four years of model data available.

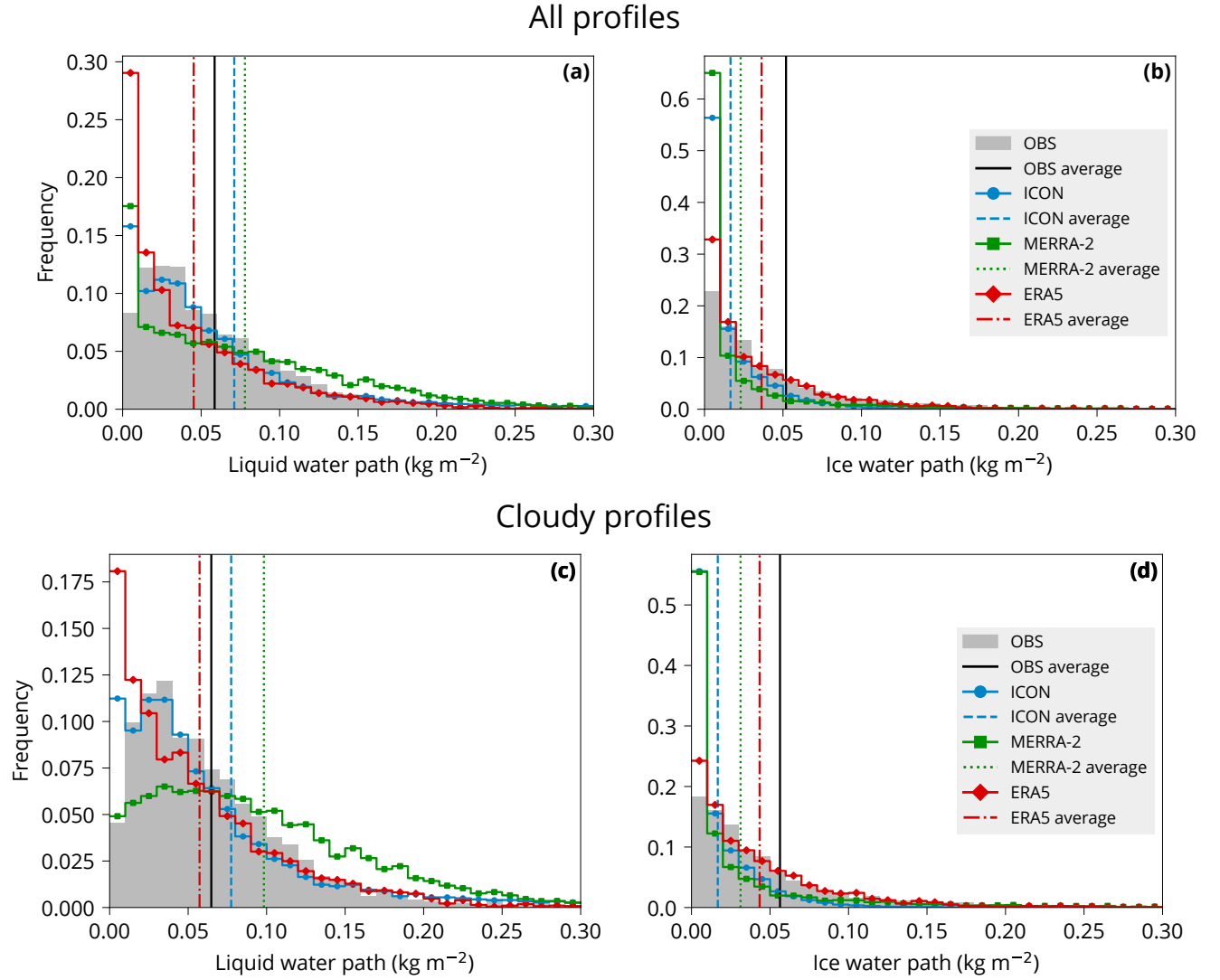


Figure S3. Histograms and averages of (a, c) liquid water path and (b, d) ice water path in CERES SYN1deg observations (OBS), ICON, MERRA-2, and ERA5 for (a, b) all and (c, d) cloudy profiles. All campaigns are weighted equally. The statistics are calculated from daily mean values corresponding to each time step and geographical location of the voyage tracks and stations.

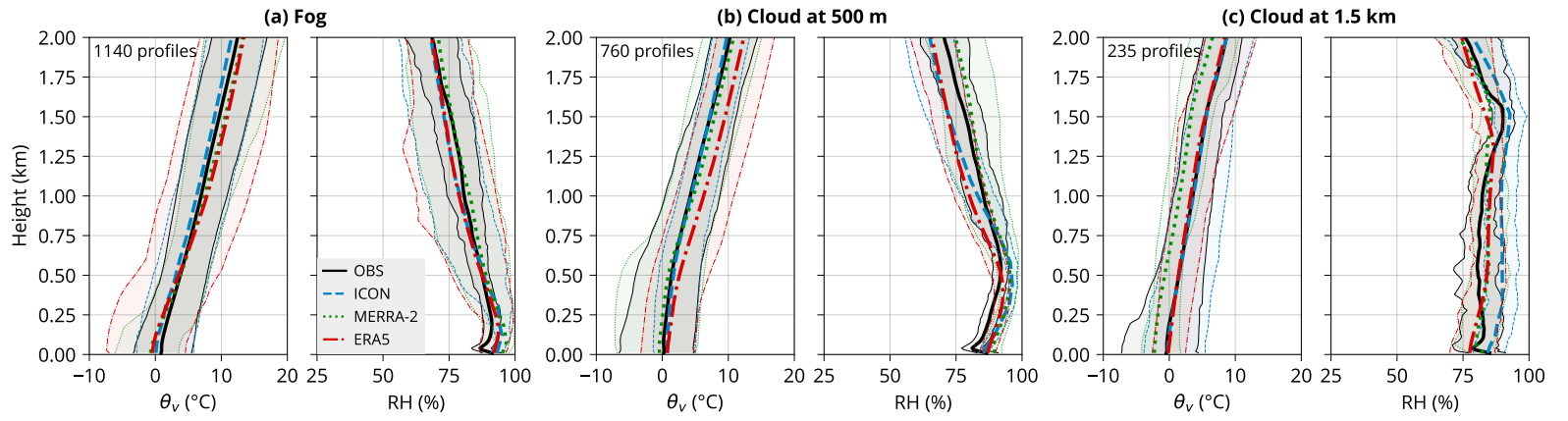


Figure S4. The same as Fig. 9, but only for profiles that contain (a) fog, (b) cloud at 500 m, and (c) cloud at 1.5 km.

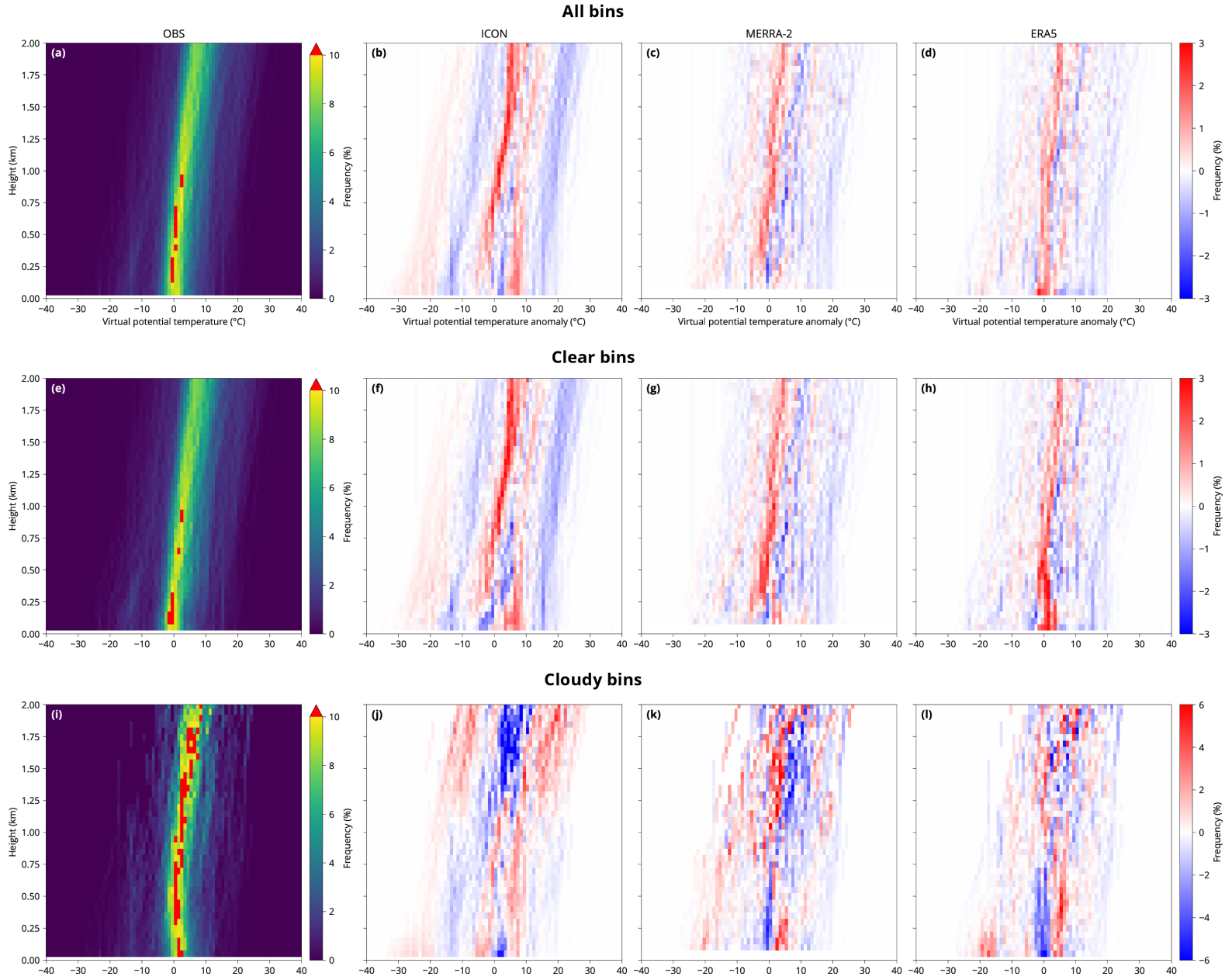


Figure S5. The same as Fig. 11, but for virtual potential temperature.