Supplementary Figures

French, Klekociuk and Mulligan - Analysis of 24 years of mesopause region OH rotational temperature observations at Davis, Antarctica. Part 2: Evidence of a quasi-quadrennial oscillation (QQO) in the polar mesosphere.

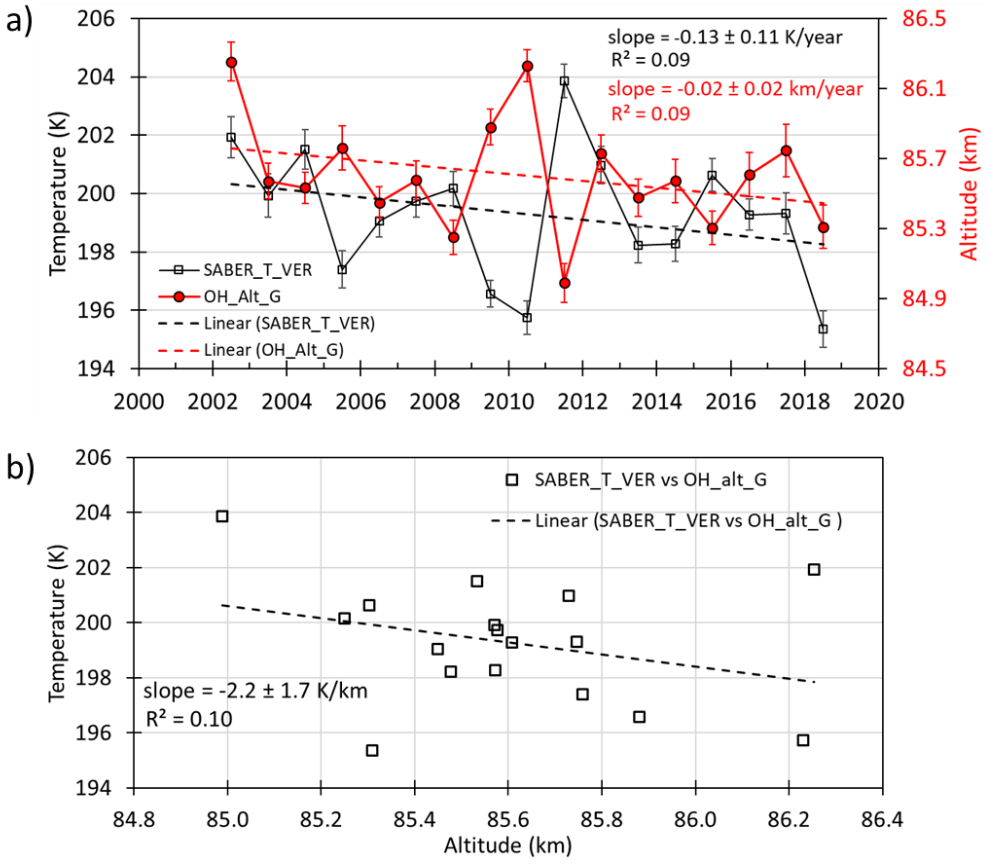

Figure S1. (a) OH layer equivalent temperatures (black) calculated from SABER VER weighted temperature profiles and the centroid altitude of a Gaussian fit to the SABER VER profiles (red) for the years 2002 to 2018 (day 106-259 of each year). The values are the average of all profiles measured by SABER within a 500 km radius of Davis station. (b) A scatter plot of the OH layer equivalent temperatures and the corresponding altitude of the OH layer shown in panel (a).

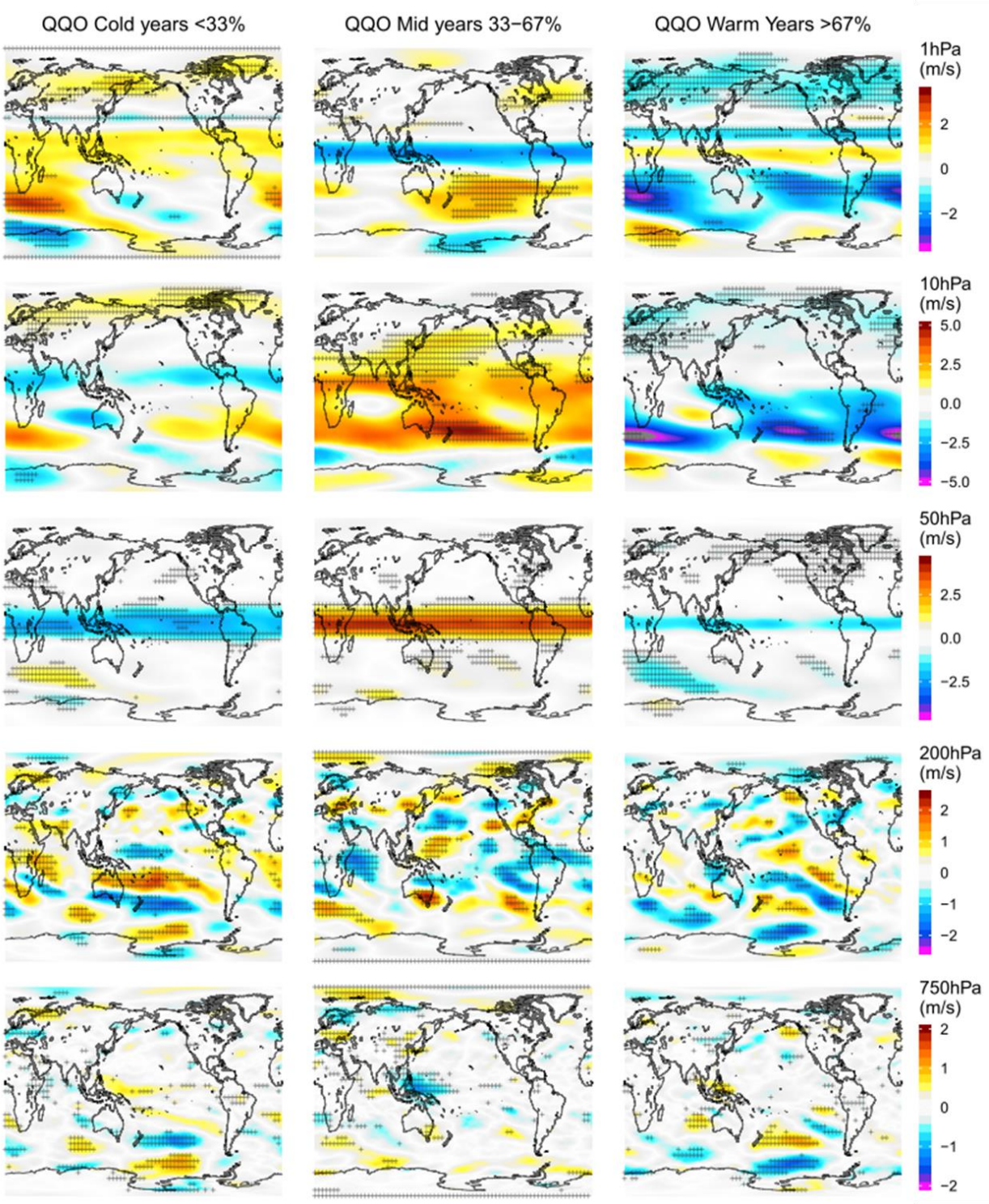

Figure S2. Composites of the ERA5 [AMJJAS] zonal wind anomaly, for cold, mid and warm years of the Davis detrended winter average QQO signal. Pressure levels are indicated on the right hand colour bar. The colour scales are in m/s. Hashed areas on the plots are significant at the 90% level.

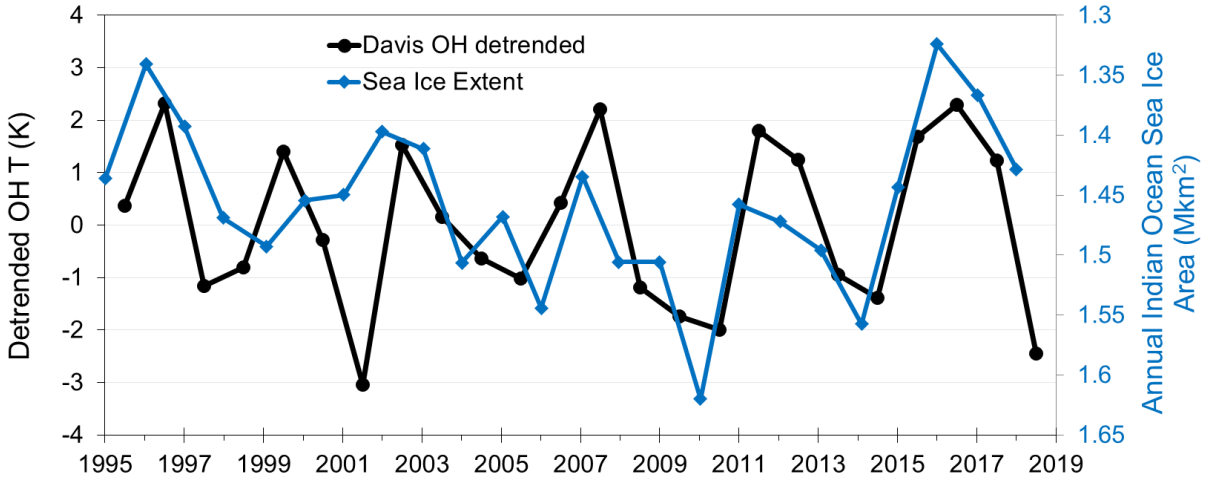

Figure S3. Detrended Davis OH winter mean temperatures compared to the Annual Indian Ocean Sea Ice Area (Mkm^2 from Parkinson, 2019). Note inverted scale for sea ice area.

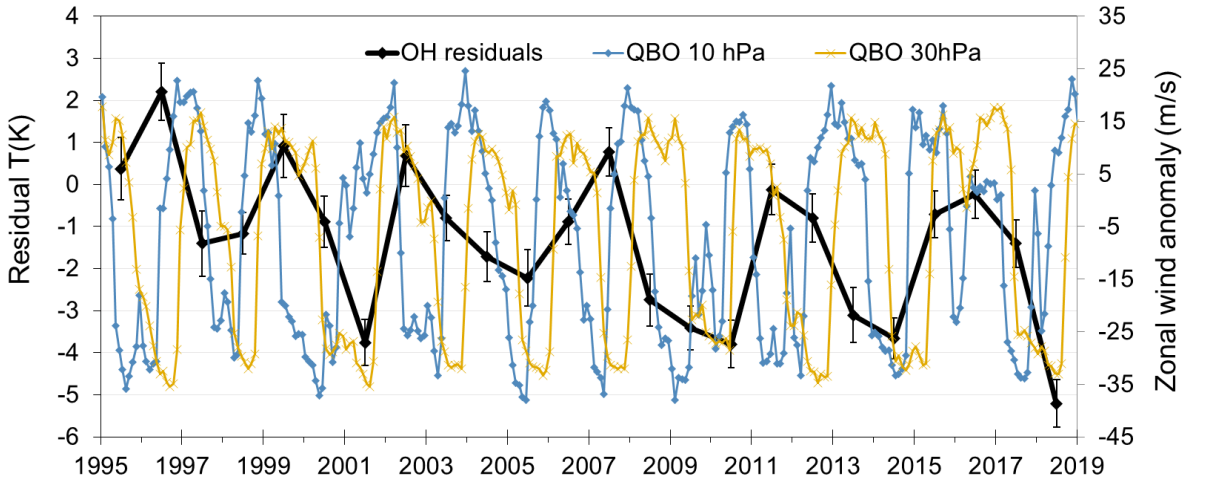

Figure S4. Davis OH winter mean residual temperatures (K) (black line; 1995-2018), and the corresponding 10 hPa (blue) and 30 hPa (yellow) standardized monthly averaged zonally averaged zonal wind (m/s) at the equator (known as the Quasi-Biennial Oscillation (QBO). QBO data were obtained from the 30 hPa and 10 hPa Singapore QBO data (https://www.geo.fu-berlin.de/en/met/ag/strat/produkte/qbo/).

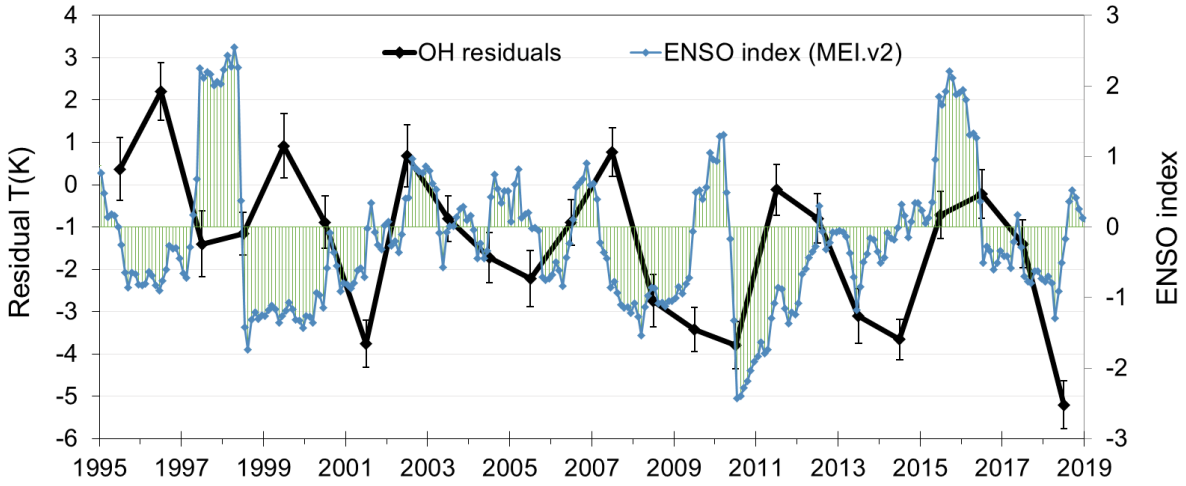

Figure S5. Davis OH winter mean residual temperatures (K) (black line; 1995-2018), and the corresponding values of the Multivariate El Nino Southern Oscillation Index (MEIv2). The time series is bimonthly so the Jan value represents the Dec-Jan value and is centered between the months. Details and current values were obtained from NOAA ESRL (Earth System Research Laboratory) Physical Sciences Division (PSD) MEI webpage (https://www.esrl.noaa.gov/psd/data/correlation/meiv2.data).