

The Antarctic radio tropopause, cirrus clouds and their relation to meteorological systems

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Data from a suite of instruments located at Davis, Antarctica (69S, 78E) enable a detailed investigation of dynamics and thin clouds in the upper troposphere and lower stratosphere (UTLS). A vertically-pointing Rayleigh lidar provides observations of tropospheric cirrus clouds; a Very High Frequency radar resolves the year-round radar tropopause; and vertically-resolved ozone profiles are available from co-located ozonesonde launches. Using these data, I will discuss the sub-diurnal structure and the seasonal variability of the Antarctic radar tropopause and its relation to upper tropospheric meteorological disturbances. Optically thin cirrus clouds near the tropopause are observed at Davis with the lidar. I will present a case study to illustrate the behaviour of these clouds in relation to the dynamical and chemical structure of the UTLS during a tropopause fold and demonstrate the capability of the lidar for observing sub-visual cirrus. Lastly I will discuss current and future plans for obtaining the full three-dimensional wind field throughout the upper troposphere and lower stratosphere with the radar, and the science objectives which we will set out to achieve.