

A COMPARISON OF ANTARCTIC GROUND BASED HYDROXYL ROTATIONAL TEMPERATURES WITH RECENT SATELLITE OBSERVATIONS.

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An 11 year climatology (1995-2005) of mesopause region temperatures over Davis station, Antarctica (68°S, 78°E) has been derived from hydroxyl rotational spectra measured using a scanning spectrometer. The aim of this study has been to assess long term change in the high latitude mesopause; a region that is modelled to be sensitive to the effects of anthropogenic carbon dioxide increases.

Over the last few years satellite observations have provided near global coverage of many atmospheric properties and trace gas concentrations. Comparisons of Davis OH rotational temperatures with available satellite mesopause region temperatures from the Microwave Limb Sounder (MLS) on NASA's Aura spacecraft (launched Aug 2004) and the Fabry-Perot Spectrometer (ACE-FTS) on the Canadian SciSat-1 (launched Aug 2003) are provided in this paper. These results serve as a data validation sample for satellite measurements and also place the Davis observations in a global context.

One aspect of the Davis hydroxyl temperature climatology that has been difficult to characterise from a ground based station has been the large scale planetary waves that dominate winter and are superimposed on seasonal and solar cycle variations. The amplitude (up to 40K), period (10-60 days) and phase of these waves are inconsistent from year to year and consequently have a strong influence on the statistical significance of the long term trend derived. Satellite measurements provide a near global view of temperatures between 10 and 110 km to characterize these waves. Some examples are examined.