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North-South comparison of the Fe layer in the upper polar atmosphere

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In cooperation with the Australian Antarctic Division mesopause temperatures, iron densities and NLC were measured at Davis, Antarctica (69°S) by the mobile Fe-Doppler-Lidar of the IAP. From 2010 to 2012 more than 2900 hours of observations have been obtained throughout the season.

We present quasi-continuous measurements of temperature profiles in the southern hemisphere mesopause region. In a period of 120 days around summer solstice we have performed lidar observations for a total of 736 hours. The mesopause region is unexpected high and cold. Over a two week period around solstice a very strong short term depletion in Fe densities is observed. Surprisingly we found regular tides between 80 and 100 km altitude throughout all months of the year.

In 2015 the lidar system was installed at the corresponding co-latitude Andenes, Norway (69°N) at the ALOMAR observatory. More than 1300 hours of observations are already available and are compared with the southern hemisphere observations. The measurements already cover the whole season including the important summer months with the cold summer mesopause. The temperature measurements are in good agreement with rocket borne observations of temperature (falling sphere) which have been obtained about many years at this latitude.