

# **Microwave observations and modeling of arctic middle atmospheric water vapor since 1995**

**P. Hartogh** (1), C. Jarchow (1), L. Song (1), G.R. Sonnemann (1,2), M. Grygalashvily (2)

(1) Max-Planck-Institute for Solar System Research, (2) Leibniz-Institute of Atmospheric Physics at the University of Rostock

Middle atmospheric water vapor measurements using a ground-based 22 GHz heterodyne spectrometer have been performed at the Arctic Lidar Observatory for Middle Atmospheric Research (ALOMAR, 69.29 N, 16.03 E) since 1995. The data show a pronounced annual cycle with - compared to mid latitudes- considerably higher amplitudes and a year-to-year variability which may be related to the QBO. The mesospheric winter data seems to be influenced by the 11-year solar cycle. We examine the spatiotemporal structure of the observed water vapor variability on the basis of a sophisticated 3 d-model of the dynamics and chemistry of the middle atmosphere (0-150 km) particularly designed to investigate the MLT-region (Mesosphere-Lower Thermosphere). The model reflects on the whole the observations quite good although in some details differences exist. We discuss the results in terms of chemistry and dynamics.