



Ground-based Microwave Observations and Model Calculations of Ozone Depletion in the Arctic Atmosphere due to the Solar Proton Events in October/November 2003

G. Kopp (1), M. Palm (2), G. Hochschild (1), J. Notholt (2), U. Raffalski (3), Th. Reddmann (1), R. Ruhnke (1), M. Sinnhuber (2), M. Wiehle (1)

(1) Institute of Meteorology and Climate Research, Forschungszentrum und Universität Karlsruhe, Germany, (2) Institute of Environmental Physics, University of Bremen, Germany, (3) Institute of Space Physics, IRF, Kiruna, Sweden, (gerhard.kopp@imk.fzk.de, mathias@iup.physik.uni-bremen.de, uwe.raffalski@irf.se)

We present observations of the ground-based microwave radiometers at Kiruna (67.8° N, 20.4 E°) and Ny-Ålesund (78.9°N, 11.9°E) of the years 2003 and 2004. During the time span covered by both instruments a series of strong solar proton events (SPEs) between 26 October and 6 November 2003 occurred and led to ozone depletion in the mesosphere and stratosphere.

To investigate ozone depletion in the mesosphere and upper stratosphere during the days after the solar proton events a 2D-model of IUP Bremen is used showing a rapid decrease in ozone vmr values. Long-term effects in the stratosphere are examined using the KASIMA model of IMK Karlsruhe which yields an ozone deficit lasting for several months after the solar proton events. The mesospheric and stratospheric ozone depletion can also be observed in the microwave data and agrees well with the model results.