

# **A plan for continuous measurements of mesospheric ozone, NO<sub>x</sub> and HO<sub>x</sub> with a ground-based millimeter-wave radiometer in Chile**

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We present a plan for monitoring mesospheric ozone, HO<sub>x</sub> and NO<sub>x</sub> by using a ground-based millimeter-wave radiometer at Atacama, Chile (23.0S, 67.7W, Alt. 4800m) in order to reveal influence of energetic particles such as a proton and an electron entering the earth atmosphere on the mesospheric chemical composition. Recent studies reported enhancement of NO<sub>x</sub> and HO<sub>x</sub> and ozone depletion in the mesosphere at the solar proton event in 2003 (e.g. Jackman et al. 2005). In 2007, we will start measuring emission spectra from the mesospheric ozone, HO<sub>2</sub>, NO and NO<sub>2</sub> simultaneously in 250 GHz band by using the radiometer equipped with a superconducting (SIS) receiver and several high resolution digital spectrometers. A millimeter-wave measurement is one of the most suitable methods to monitor the mesospheric minor constituents whose vertical distributions are estimated from the high resolution spectra with a heterodyne spectroscopy technique. Simulation results show that spectral line intensities of HO<sub>2</sub> and NO<sub>2</sub> emission are estimated to be about 20 mK and that of NO is about 3 mK, indicating that we can measure HO<sub>2</sub> and NO<sub>2</sub> emission in 6 hours integration. On the other hand, the NO emission may be detected when the NO distribution is enhanced by an order of magnitude.