

AAS020-17

Room:102

Time:May 22 16:30-16:45

## Middle atmospheric chemistry and dynamics: results from the SMILES mission

Masato Shiotani<sup>1\*</sup>, Masahiro Takayanagi<sup>2</sup>, Yasuhiro Murayama<sup>3</sup>

<sup>1</sup>Kyoto University, <sup>2</sup>JAXA, <sup>3</sup>NICT

The Superconducting Submillimeter-Wave Limb-Emission Sounder (SMILES) was developed to be aboard the Japanese Experiment Module (JEM) on the International Space Station. SMILES was successfully launched by the H-IIB rocket with the H-II Transfer Vehicle on September 11, 2009, was attached to JEM on September 25, and started atmospheric observations on October 12. Unfortunately, SMILES observations have been suspended since April 21, 2010 due to the failure of a critical component in the submillimeter local oscillator. However, high-sensitivity measurements of minor species had been performed by a receiver using superconductor-insulator-superconductor (SIS) mixers, cooled to 4.5 K by a compact mechanical cryocooler. Thus global and vertical distributions of about ten atmospheric minor constituents related to the ozone chemistry are derived. The mission objectives are as follows: i) To demonstrate a 4-K mechanical cooler and superconducting mixers in the environment of outer space for submillimeter limb-emission sounding and ii) To measure atmospheric minor constituents in the middle atmosphere globally in order to gain a better understanding of factors and processes controlling the stratospheric ozone amounts and those related to climate change. In this talk, an overview of the SMILES measurements will be introduced with some observational results in association with middle atmospheric chemistry and dynamics. These results demonstrate SMILES abilities to observe the atmospheric minor constituents in the middle atmosphere.

Keywords: Middle Atmosphere, Ozone Chemistry, Atmospheric Dynamics, Satellite Measurement, International Space Station