

AAS020-17

会場:102

時間:5月22日 16:30-16:45

中層大気の化学と力学：SMILES ミッションから得られた成果 Middle atmospheric chemistry and dynamics: results from the SMILES mission

塩谷 雅人^{1*}, 高柳 昌弘², 村山 泰啓³

Masato Shiotani^{1*}, Masahiro Takayanagi², Yasuhiro Murayama³

¹ 京都大学, ² 宇宙航空研究開発機構, ³ 情報通信研究機構

¹Kyoto University, ²JAXA, ³NICT

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.

キーワード: 中層大気, オゾン化学, 大気力学, 衛星観測, 国際宇宙ステーション

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