

Capability study for ozone high-precision retrieval with JEM/SMILES

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Submillimeter-wave Limb Emission Sounder (SMILES) will be launched and aboard the Japanese Experiment Module (JEM) of the International Space Station (ISS) in 2009. It observes limb emission from atmospheric minor constituents in the stratosphere, such as O₃, ClO, HCl, HNO₃, HOCl, CH₃CN, HO₂, BrO, O₃ isotopes etc. The measurement bands are bandA (624.3-625.5 GHz), bandB (625.1-626.3 GHz), and bandC (649.1-650.3 GHz) in the altitude range between 10 and 60 km and the latitude coverage from 65N to 38S.

We have been developing the level2 data processing system for the SMILES. This system performs the near-real-time retrieval processing or converts emission spectra (Level1B data) into the vertical profiles of the atmospheric minor constituents concentrations. The SMILES is a high sensitive sensor comparing with existing similar sensors, such as Aura/MLS and Odin/SMR. The level2 data processing is very important to obtain the high-precision results to take advantage of such high sensitive measurements. In this report, we discuss the operational algorithm developed to be adequate for SMILES performances and results of the capability study for ozone high-precision retrieval based on this algorithm.