Estimated accuracy of intensity and field of view in JEM/SMILES limb spectral data

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Superconducting Submillimeter-Wave Limb-Emission Sounder (SMILES) will be launched and aboard Japanese Experiment Module of the international space station in 2009. SMILES is a sensor with 640 GHz receiver which observes limb emission of stratospheric and mesospheric chemical components such as, O_3, HCl, ClO, HOCl, HO_2, HNO_3, CH_3CN, and BrO. SMILES will take limb emission spectra in a precision of about 1 K (frequency resolution 1.8 MHz and integration time 0.5 s) every 53 s or every 380 km along the track in the latitude range between 64N and 34S. In this fiscal year the SMILES flight model receiver will be prepared. The ground calibration data will be taken with the flight model.

Ground facility of SMILES can be divided into low level processing and high level processiong. The high level processing includes Level 2 processing which convert emission spectra into height profile of chemical compositions. Level 1 processing that is in the low level processing converts raw data into limb emission spectra with geometric information, which was developed in FY2006.

SMILES has an advantage of high sensitivity comparing with existing submillimeter sensors, such as Aura/MLS and Odin/SMR. Precise calibration of emission spectra is highly important to make the best use of SMILES' sensitivity. In this report, we discuss the outline of Level 1 processing, estimated precision of emission spectra, and plan of ground calibration and expected result that influence the emission precision.