ISS/JEM/SMILES L2

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Overview of operation and L2 data products of ISS/JEM/SMILES

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The Superconducting Submillimeter-Wave Limb-Emission Sounder (SMILES) was successfully launched and attached to the Japanese Experiment Module (JEM) on the International Space Station (ISS) on September 25, 2009. It has been making atmospheric observations since October 12, 2009 with the aid of a 4-K mechanical cooler and superconducting mixers for submillimeter limb-emission sounding in the frequency bands of 624.32-626.32 GHz and 649.12-650.32 GHz. SMILES observations have been suspended since April 21, 2010 due to the failure of a critical component.

The Level 2 data processing has been retrieving vertical profiles for the atmospheric minor constituents in the middle atmosphere, such as O_3 with isotopes, HCl, ClO, HO_2, BrO, and HNO_3. Results from SMILES have demonstrated its high potential to observe atmospheric minor constituents in the middle atmosphere.

Figure. Globally mapped ozone distributions at 28 km on October 12, 2009. Original observation points are plotted by white circles with observed ozone mixing ratios.