

The SPARC Data Initiative - Observation of UT/LS water vapor with the Submillimeter-Wave Limb Emission Sounder, SMILES

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This poster contribution is part of the SPARC Data Initiative poster cluster, which presents atmospheric composition climatologies from the upper troposphere to the middle mesosphere from a multi-national suite of space-based instruments. In this poster, we will present new observational findings on the upper tropospheric and lower stratospheric (UT/LS) water vapor distribution, obtained by JEM/SMILES. SMILES (Superconducting Submillimeter-Wave Limb-Emission Sounder) is a limb emission sounder attached on the Japanese experiment module (JEM) onboard the International Space Station (ISS). Although SMILES has no water vapor transitions in its observation spectral range, a significant contribution of the water vapor opacity due to far wings of the 620 and 557 GHz transitions comes into the measurement spectra. One of the unique characteristics of the SMILES observation is the non-sun synchronous orbit of the ISS. By accumulating the data from several ISS orbits, diurnal variations of the atmospheric constituents can be analyzed. In fact, this characteristic enhances the value of SMILES data for the UT/LS water vapor study, since the diurnal cycle of UT/LS water vapor shall allow us to study occurrence of tropical deep convection.