



Observation of diurnal variation of atmospheric compositions in the middle atmosphere by SMILES

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Superconducting SubMillimeter-wave Limb Emission Sounder (SMILES) observed the direct observations of the diurnal variation of Ozone, HCl, ClO, HOCl, HO₂, ClO, HNO₃, CH₃CN, BrO, Upper tropospheric humidity, Ice Cloud, in the middle atmosphere using a new super-sensitive remote sensing technology from the International Space Station (ISS). Simultaneous observation of these species allow us to estimate the reaction rate of the chemical reactions, such as ClO + HO₂ → HOCl + O₂ in upper stratosphere/lower mesosphere (US/LM) region. Good understanding of the link of the odd chlorine ClO_x and odd hydrogen HO_x chemistry in the ozone chemistry is needed for the understanding of the current status of the tropospheric/stratospheric/mesospheric ozone.