

A plan of submillimeter limb sounder for measurement of the middle atmosphere

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Submillimeter-wave limb sounder has a potential for precise observation of temperature, wind, and chemical compositions in a wide altitude range of the Earth's atmosphere. The Superconducting Submillimeter-Wave Limb-Emission Sounder (SMILES) has demonstrated the highly sensitive observation with space qualified superconducting receivers by showing fruitful measurement results, such as global wind distribution and diurnal variation of chemical compositions in stratosphere and mesosphere. We are proposing a new submillimeter limb-sounder observation. A THz channel will be added to the limb sounder for measurement of atomic oxygen at 2.06 THz and the lower thermospheric temperature/wind measurement. A SMILES-inherited sounder, which will have SIS receivers for submillimeter O₂, H₂O, O₃ lines and HEB receiver for atomic-O line with steerable 1-meter class reflector antennas, can make well height-resolved precise observation in an altitude range from the stratosphere to lower thermosphere. We are studying the feasibility of the new sounder and developing THz mixer for the receiver and reflector materials for the antenna.

Key words: satellite observation, sensor development, terahertz, microwave, SMILES

References

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