

Monitoring Observations of the Middle Atmospheres of Solar Planets at Millimeter-Wave Band with SPART Telescope

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Investigation of the abundance and time variation of minor constituents of planetary atmospheres and of the isotopes of these constituents provides important information about the dynamical and chemical balances and evolutionary processes of the atmospheres. To study how activities of the Sun, a typical G-type star in our galaxy, influence the physical conditions and (photo)chemical reaction network of the middle atmospheres of Venus, Mars, and gas-giant planets, we started monitoring observations of the spectral lines of the minor constituents such as carbon monoxide ($J = 1-0$: 115 GHz) in the Martian and Venusian middle atmosphere by using the SPART (Solar Planetary Atmosphere Research Telescope) which is the 10-m single dish telescope taken from the Nobeyama Millimeter Array System of Nobeyama Radio Observatory of Japan. In 2012 we installed a 200 GHz band SIS heterodyne detector onto the SPART newly to apply the retrieval analysis to the spectral line data precisely. Updates of the instruments and the computer system with Linux/Python-software enabled us to carry out highly-efficient monitoring and on-the-fly mapping observations toward Venus and Jupiter as well as dark clouds at the 200 GHz Band remotely. We will present the current status of this project at the conference.

Keywords: Solar Planets, Planetary Atmosphere, Radio Telescope, Heterodyne Spectroscopy, Solar Activity