

Improvement and Performance Test of an Infrared Laser Heterodyne Spectrometer Developed for Observations of Planetary Atmosphere

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We have been developing an infrared laser heterodyne spectrometer in the wavelength range of 9 ~ 12 microns for remote sensing of planetary atmosphere from the ground. This spectrometer is equipped with a tunable diode laser as a local oscillator and a compact acousto-optic spectrometer (AOS) as its back-end. We improved bandwidth, resolution and SNR of this spectrometer and carried out its performance test. The bandwidth and resolution of AOS were considerably improved (700 ~ 800 MHz for bandwidth and 2.3 MHz for resolution). The signal to noise ratio obtained from terrestrial ozone spectral measurement was also improved by five times. Using the improved bandwidth, resolution and SNR, we numerically simulated the case of Venusian atmosphere observation by this spectrometer.

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