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Title: Ground-based Microwave Radiometer to Monitor Stratospheric Ozone above Seoul

Abstract:

Ground-based microwave radiometry has been applied to detect the emission from stratospheric ozone at 110GHz. The remote sensing system consisting of a millimeter wave radiometer monitors the spectral line of ozone at 110.8359 GHz. The rotational transition of ozone (60,6 - 51,5) has been monitored to detect the variation of the stratospheric ozone profile above the Sookmyung Women's University (37:35:32 N, 126:58:00 E) in Seoul since Jan. 1, 2000. This observing method has provided a real-time analysis of the stratospheric ozone above Seoul, Korea. The ozone detection system, a millimeter-wave receiver system based on the heterodyne principle, is composed of an antenna, quasi-optics, local oscillator, mixer, intermediate frequency amplifiers, spectrometer, and computer. The altitude distribution of stratospheric ozone was obtained using Rodgers's optimum estimation method. The brightness temperature at this frequency is in the range of 80 Kelvin and atmospheric transmittance was about 70 - 90 % during observation. The mixing ratio shows the maximum at about 25- 30 km height and varies about 20 % over the time. These results are consistent with satellite measurement such as HALOE on UARS, NASA. We plan to develop a new ozone radiometer with HEMT-amplifiers at room temperature. This radiometer will be the first ozone radiometer to use direct amplification which will lead to high performance and stability. We present results for stratospheric data obtained with the old instrument and will discuss the concept of the new radiometer system.

Presentation Mode: Poster

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