Mesospheric Monitoring of Ozone above the Polar Vortex (MeMO)

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Abstract

Satellite and ground-based ozone measurements were widely used to monitor ozone and many other atmospheric trace gases. However, most of the ozone monitoring instruments have limited measurement response at the altitude over 70 km. The Ku-band radiometer MOSAIC measures the emission line at 11.07GHz, providing ozone density in the mesosphere and the lower thermosphere. MOSAIC is portable, inexpensive, and independent from the solar radiation. The 11.07 GHz emission line is sensitive to the second ozone maximum at 92 km and to the third ozone peak at around 72 km in the polar regions. Thus, MOSAIC is optimal to be investigated and distributed within the Polar cap to provide continuously day and night ozone monitoring, which fills the gap of the satellite and traditional ground-based measurements. Moreover, the observed ozone data is crucial in helping to understand the space weather induced ozone variation in the upper atmosphere, and it's influence to the lower atmosphere within Polar Vortex. In this presentation, the MeMO project is introduced. The instrument development and data analysis are reported.