

Study of the polar mesopause region by remotesensing of OH airglow.

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The mesopause region is one of the interesting regions in the upper atmosphere because its complicated energy balance. Energy deposit by gravity waves propagating from the lower atmosphere, coupling with an ionized atmosphere and auroral energy in the polar regions have to be considered. However, it has not been studied well because of the complexity in the physics as well as lack of data about this region where methods of in situ observation are limited. Remote sensing of the OH airglow which has a layer in the mesopause region is one of the important and reliable methods to know information on temperature and waves in this region, and has been widely applied in the middle and low latitude regions. On the other hand, it is difficult to apply this technique to observation in the polar region where auroral emissions can be contamination in the measurement. In order to study the polar mesopause regions using the OH airglow, the following two steps have been proposed. Firstly, a spectrum survey observation is performed to find an OH vibration-rotation band which is not contaminated by auroral emissions with a spectrometer with medium spectral resolution. Next a high-sensitive and fast spectrometer that can measure the vibration-rotation band is developed and is put into a long term continuous observation in Syowa Station, Antarctica. This study describes the results from the first step in which spectroscopic observations were conducted in Uji and Tromsø.