

R005-P06

ポスター 3 : 11/25 PM1/PM2 (13:15-18:15)

## 極域中間圏界面領域への高エネルギー粒子降込みに伴う OH 大気光強度変動

#石井 智士<sup>1)</sup>, 鈴木 秀彦<sup>2)</sup>, 田中 良昌<sup>3,4,5)</sup>, 田口 真<sup>1)</sup>, 堤 雅基<sup>4,5)</sup>, 江尻 省<sup>4,5)</sup>, 西山 尚典<sup>4,5)</sup>, 門倉 昭<sup>3,4,5)</sup>

(<sup>1)</sup>立教大, (<sup>2)</sup>明治大, (<sup>3</sup>)ROIS-DS, (<sup>4</sup>)国立極地研究所, (<sup>5</sup>)総研大

## Variation of OH Airglow Intensity Associated with Energetic Particle Precipitation in the Polar Mesopause Region

#Satoshi Ishii<sup>1)</sup>, Hidehiko Suzuki<sup>2)</sup>, Yoshimasa Tanaka<sup>3,4,5)</sup>, Makoto Taguchi<sup>1)</sup>, Masaki Tsutsumi<sup>4,5)</sup>, Mitsumu K Ejiri<sup>4,5)</sup>, Takanori Nishiyama<sup>4,5)</sup>, Akira Kadokura<sup>3,4,5)</sup>

(<sup>1</sup>)Rikkyo University, (<sup>2</sup>)Meiji university, (<sup>3</sup>)ROIS-DS, (<sup>4</sup>)National Institute of Polar Research, (<sup>5</sup>)SOKENDAI

We conducted ground-based spectral observations of OH (8-4) airglow emitted from the mesopause region at Syowa Station during the winter seasons from February 2008 to October 2019. These observations have been carried out again since 2021. We derived the rotational line intensities of the OH (8-4) band (OH intensity) and the corresponding rotational temperatures. We observed distinct intensity variations occurring over periods ranging from several tens of minutes to several hours. These variations differed from the sinusoidal patterns typically caused by atmospheric gravity waves, which are commonly observed in the mid-latitude regions. Instead, they exhibited sharp peaks. The OH molecule becomes excited through an exothermic reaction between an ozone molecule and atomic hydrogen. It is believed that energetic particle precipitation (EPP) into the upper atmosphere produces NO<sub>x</sub> and HO<sub>x</sub>, which subsequently lead to the destruction of ozone molecules. Therefore, the OH intensity is believed to fluctuate due to changes in the atmospheric composition of the polar mesopause associated with EPP. We extracted EPP events from cosmic radio noise absorption data obtained through the imaging riometer observations at Syowa Station. Image data captured by the color digital cameras at Syowa Station were used to check auroral activities. Analysis of these data suggests that some events of the OH intensity variations occurring within a few hours appear to be correlated with the temporal development of auroral substorms. The OH intensity increases before EPP events, decreases afterward, and also decreases when the aurora becomes active.

In this presentation, we will illustrate the temporal variations in OH intensity correlated with the auroral activities detected over Syowa Station from 2016 to 2022. Additionally, we will discuss the effects of EPP in the polar mesopause regions.