

**R005-49**

**Zoom meeting C : 11/2 PM2 (15:45-18:15)**

**17:00~17:15**

## **Atmospheric instabilities in the polar upper mesosphere (2)**

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The sodium LIDAR at Tromsø (69.6N, 19.2E) has been operated for 9 years since October 2010. For the first two winters, we have observed neutral temperature and sodium density between about 80 and 110 km. Since October 2012, wind measurements have been made together with the both measurements. Utilizing these temperature and wind data, we have calculated Brunt-Vaisala frequency ( $N$ ) and Richardson number ( $Ri$ ) to study the atmospheric instabilities between about 80 and 110 km above Tromsø. Using those values, we have calculated probabilities of the static instability ( $N < 0$ ) and the dynamic instability ( $0 < Ri < 0.25$ ) that can be used for proxies for evaluating the atmospheric instability. We have addressed what makes the atmosphere unstable: possible relationship with gravity wave activity, semidiurnal tidal amplitude, solar activity (F10.7 index), and geomagnetic disturbance (local K-index) is investigated.

In this talk, in particular we will focus on (1) horizontal spatial extent and duration time of the static unstable region, and (2) dependence of the static and dynamic instabilities on the semidiurnal tidal amplitude.