

# A comparison between E-region neutral temperatures derived from the EISCAT radars and the MSIS model

# Sawako Maeda[1]; Hitoshi Fujiwara[2]; Satonori Nozawa[3]

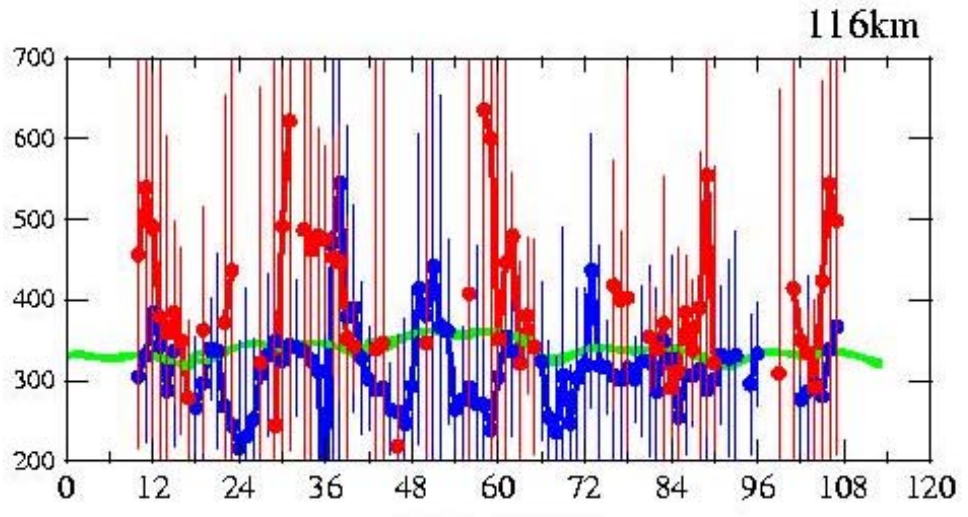
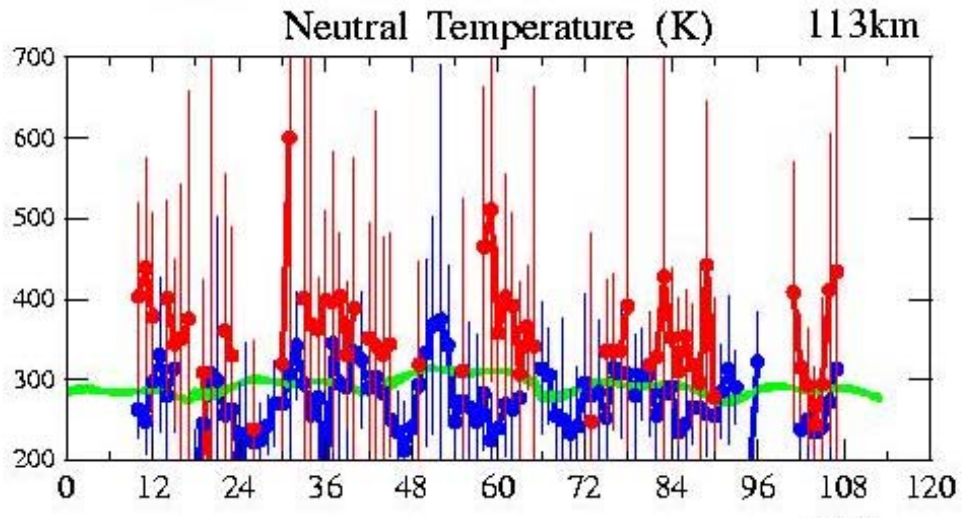
[1] Kyoto Women's Univ.; [2] Graduate School of Science, Tohoku University; [3] STEL, Nagoya Univ

The neutral temperature in the dayside E-region at the low-latitude boundary of the polar cap has been compared with that in the auroral latitudes by using the EISCAT-UHF radar at Tromsø and the ESR at Longyearbyen. In order to clarify the temperature difference between Tromsø and Longyearbyen, it is important to quantify the errors associated with the neutral temperature derived from the measured ion temperature and velocity via the ion momentum and energy equations.

We have evaluated the errors on the basis of the propagation theory of error. In March 8-12 1999, the standard deviation of the temperature between 06 and 12 UT at 116-117km height was about 82K and 177K in the cases of the EISCAT-UHF radar and the ESR, respectively. The dayside temperature at Longyearbyen was higher than that at Tromsø by 155K, 210K, 222K, 31K and 100K on the five consecutive days, respectively. Since the error estimated from the standard deviation of the temperatures was in the range between 100 and 190 K, the temperature difference at the two locations was statistically significant only in March 8, 9, 10 and 12.

We have also compared with the dayside E-region neutral temperature derived from the two EISCAT radars with the temperature calculated by the MSIS 90 model. The temperature obtained by the EISCAT-UHF radar was similar to the MSIS temperature. The temperature obtained by the ESR, however, was higher than the MSIS temperature more than 100K.

- Tromsø
- Longyearbyen
- MSIS



UT (hrs)  
day = 308      309      310      311      312