

Diurnal variations of electron density at mid- to high-latitudes in summer during the 2008-2009 solar minimum period

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We investigate the diurnal variations of electron density in the middle and high latitude summer ionosphere during the last deep solar minimum period. For this study, we use the electron density profiles obtained from incoherent scatter radars at Millstone Hill, European Incoherent Scatter UHF radar (EISCAT) in Tromsø, and EISCAT Svalbard radar (ESR) and total electron content (TEC) measured by JASON-1 satellite. The data show that there is a density peak in the evening in addition to the daytime peak. This evening peak at mid-latitude is particularly distinctive in summer, even larger than the daytime peak, but disappears in winter. At high latitudes, however, the evening peak becomes moderate and the altitude of the peak is also similar to the daytime peak while it is much higher than the latter at mid-latitude. We also find that the two-peak structure in summer is more distinctive in the polar cap region (e.g., in Svalbard) than in the auroral region (e.g., in Tromsø). In this presentation, we will discuss the possible explanations for the characteristics of the structure.

Conference session: Active experiments and plasma physics