Canadian Association of Physicists

Association canadienne des physiciens et physiciennes

Contribution ID: **221** Type: **Oral (Non-Student) / Orale (non-étudiant(e))**

Variations of SuperDARN ground scatter occurrence rate in the polar cap

Monday 9 June 2025 11:45 (15 minutes)

Frequent occurrence of ground-scatter (GS) is a common feature of SuperDARN observations. This study extends previously published work on GS by focusing on data collected by the polar cap radars at Inuvik and Clyde River. One of the objectives is to identify data trends affected by electron density variations in the ionosphere. For the F region GS, both radars show strong solar cycle effect with variations of GS occurrence rate by a factor of 2 consistent with changes of the peak electron density. Seasonally, GS is more frequent in summer and at nighttime. Nighttime GS occurrence rates show clear correlation with increases in the electron density. Such correlation is less obvious during daytime. Diurnally, GS occurrence rates at near noon hours have clear maxima in winter but minima in summer. Partially, the summer reduction effect can be related to the blocking effect of the E region prohibiting HF radio wave propagation into the F region as evidenced by the enhanced occurrence of GS received at shorter ranges, via E region. GS received via E region is more frequent during nighttime, and no solar cycle effect is evident.

Keyword-1

SuperDARN

Keyword-2

ground scatter echoes

Keyword-3

Author: Mr GHALAMKARIAN NEJAD, Mehdi (U of Saskatchewan)

Co-author: KOUSTOV, Alexandre (U of Saskatchewan)

Presenter: Mr GHALAMKARIAN NEJAD, Mehdi (U of Saskatchewan)

Session Classification: (DASP) M1-2 Magnetosphere and Magnetospheric Dynamics | Magnétosphère et dynamique magnétosphérique (DPAE)

Track Classification: Technical Sessions / Sessions techniques: Atmospheric and Space Physics / Physique atmosphérique et spatiale (DASP/DPAE)