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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Isolated lower mesospheric echoes seen by medium frequency radar at 70° N, 19° E" *by* C. M. Hall et al.

C. M. Hall et al.

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Thanks to the referee for the positive feedback.

Answers to "specific comments":

1. The echoes are isolated in time, i.e. sporadic, and restricted in height due to the ionisation-absorption tradeoff, although, true, our criteria isolate them from more "normal echoes". We would be prepared to drop the ILME acronym if that seems the consensus resulting from the discussion.

2. We'd like to address these two dates separately. For the short-lived night-time events in November 2004, we have examined ionograms form the co-located Dynasonde (the Tromsø digisonde being inoperative between November 2004 and February 2005). Although we have not made an exhaustive comparison, it is evident that when the

MF echoes appear, the ionogram “disappears” (i.e. there is total absorption) and vice versa. We do not know, at this time, what has caused these enhancements in electron density. Since the paper has a more statistical character, we’d prefer not to investigate these few events in detail, although it may well transpire, as suggested, that these are related to auroral precipitation. In January 2005 we are seeing the twilight effect. Protons impinge on the polar cap all the time - the reason for the diurnal variation in the signal is the night-time formation of negative ions which deplete the electron population. The evening twilight lasts about 2.5 hours - the time from sunset to a solar depression angle of 10 degrees during which negative ions form and assume the night-time state. The twilight effect is presumed to be responsible for the slight shift of echo occurrence with respect to local solar time as seen in a number of plots on closer inspection. We will include a discussion and references in a subsequent revision of the manuscript.

Answer to “technical corrections”:

We will check the manuscript carefully before revision and anticipate making corrections as suggested. However for the few of these that seem to be related to writing style the first author would like to exercise some discretion.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 7407, 2006.