

Geospace Concussion: Global reversal of ionospheric vertical plasma drift in response to a sudden commencement

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1. Captions for Movies S1 to S2

Introduction

Movie S1. Animation shows SECs equivalent ionospheric currents (black vectors) and current density (red-blue color map) from 18:25:00 UT to 18:45:00 UT on 24 October 2011. The vertical yellow line indicates local noon.

Movie S2. MAGE-simulated northern ionospheric FACs (purple-orange color map) and convection responses to the IP shock. Positive currents (orange) are downward. The green contours show the convection potential separated by every 4.0 kV. Solid curves show positive potential.

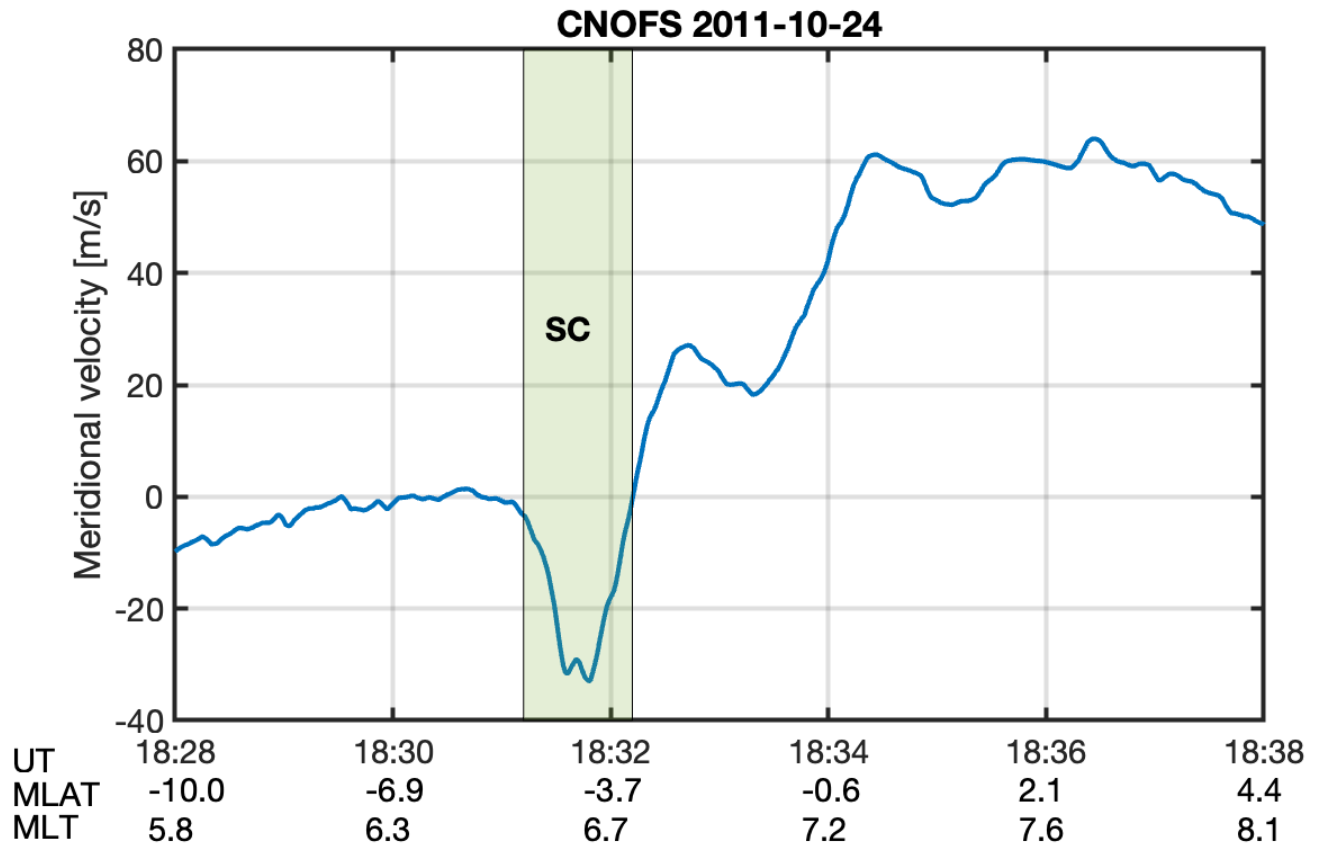


Figure S1. Vertical ion drift measured by the CNOFS satellite during the SC of the 24 October 2011 storm event. Note the meridional velocity is perpendicular to field-aligned direction and zonal direction, which is effectively vertical near the equator.

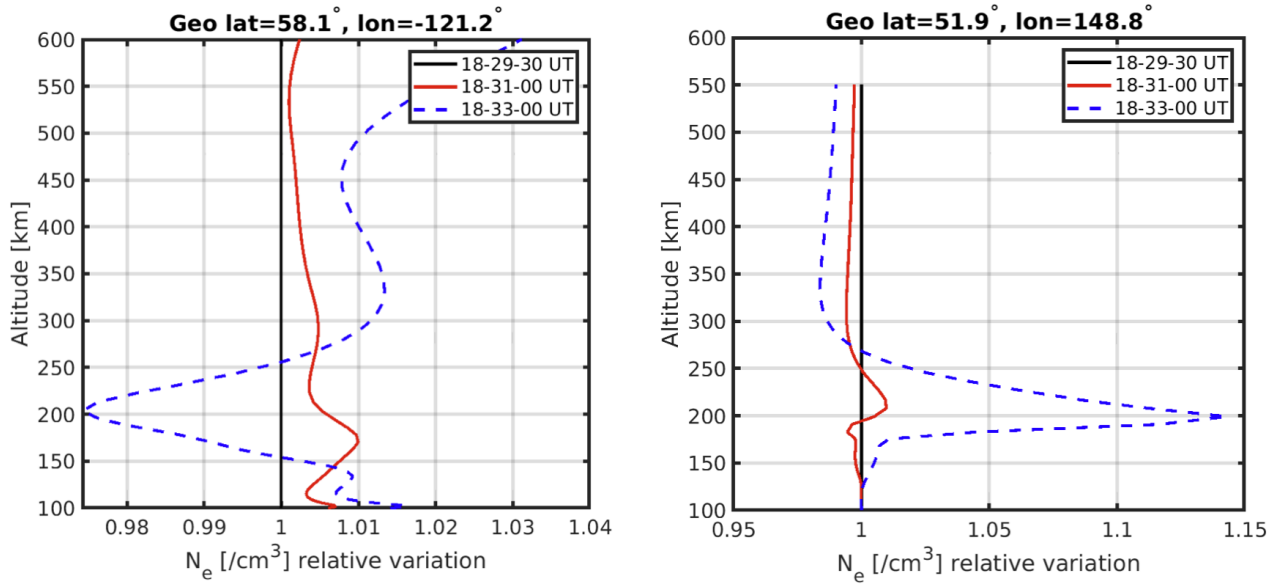


Figure S2. Electron density vertical profiles sampled at PGR (left) and HOK (right) at 18:29:30 UT, 18:31:00 UT, and 18:33:00 UT, the same three times shown in Figure 3 and Figure 4. The electron densities are output by TIEGCM and normalized by the profile at 18:29:30 UT.

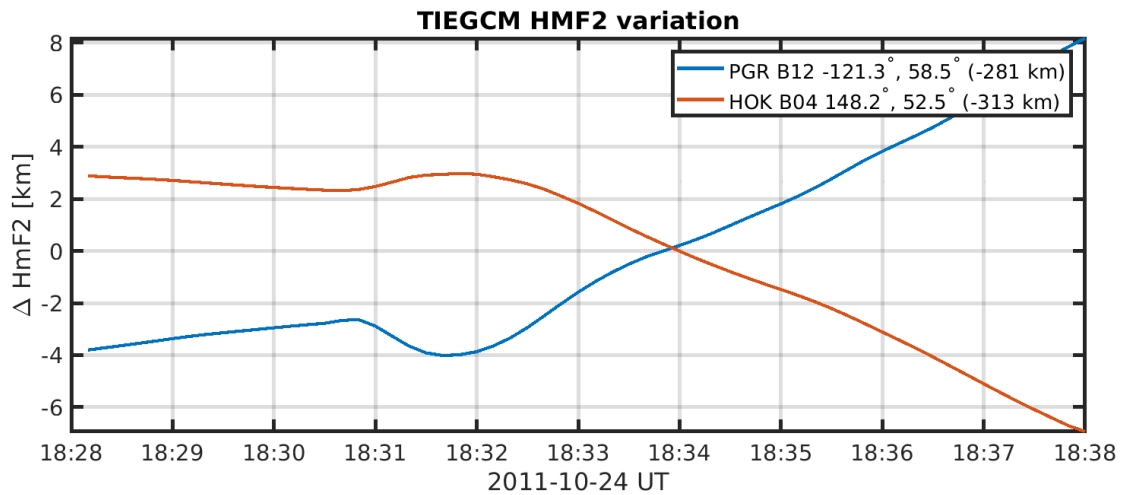


Figure S3. Time series of HmF2 sampled at the observation sites of PGR and HOK radars from 18:28:00 UT to 18:38:00 UT on 24 October 2011.