

**The role of diffuse electron precipitation in the formation of subauroral polarization streams**

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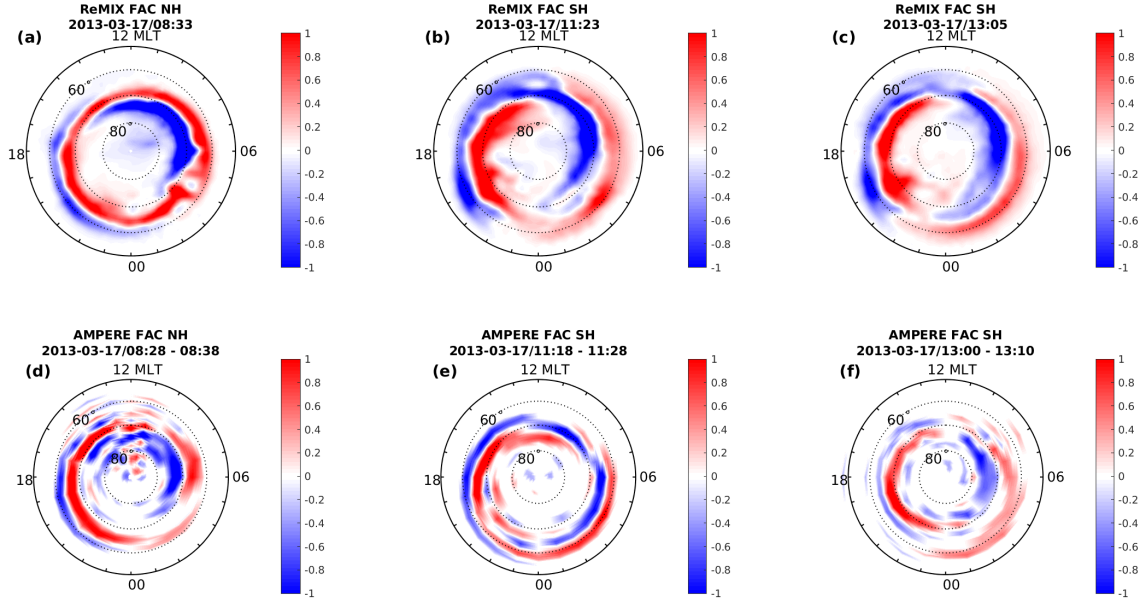
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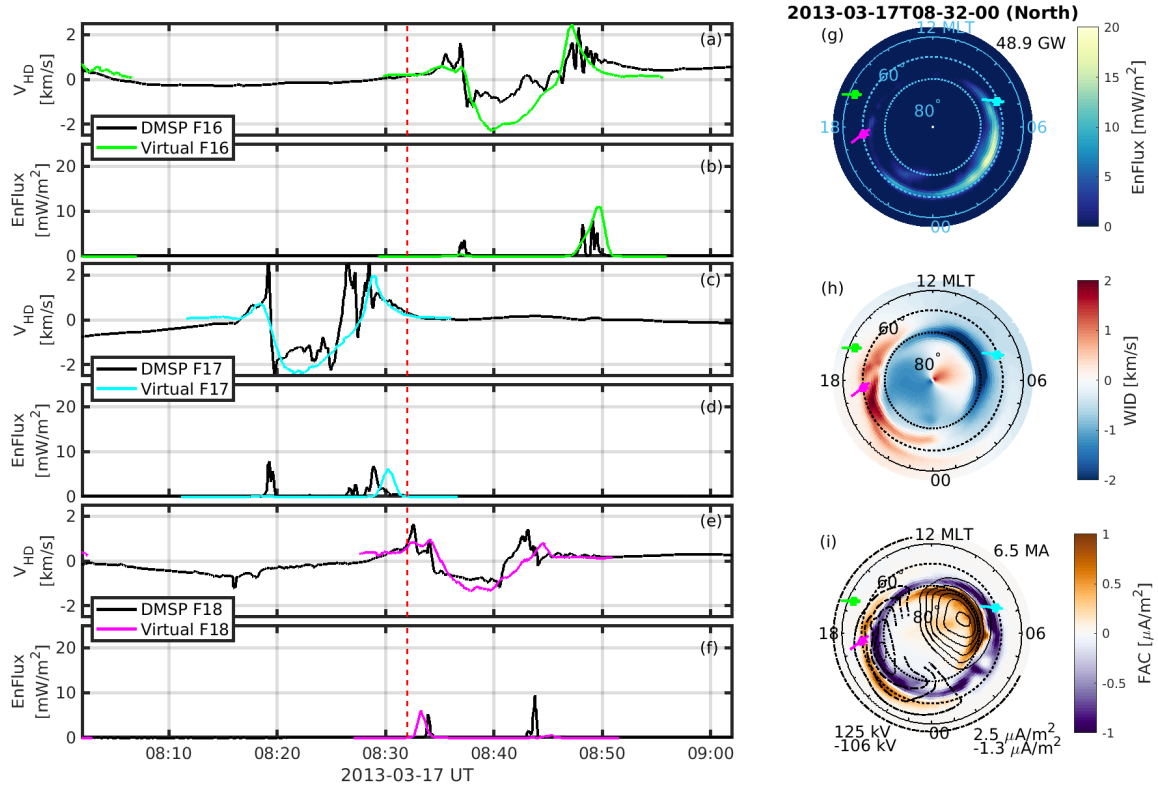
1. Figures S1.
2. Caption for Movie S1.

**Introduction**

This supporting information provides Figure S1 and caption for Movie S1 to show additional data-model comparison between the MAGE simulation results and AMPERE/DMSP measurements.



**Figure S1.** Comparison of field-aligned current (FAC) from MAGE/REMIX modeling results (top row) and AMPERE measurements (bottom row). Upward currents are shown in red and downward currents in blue. The REMIX FACs are output in the middle of the three 10-min intervals shown in Figure 2. The AMPERE FACs are fitted based on the corresponding 10-min measurements of magnetic perturbation. AMPERE data are available at <http://ampere.jhuapl.edu/>. The comparison shows that the simulated FACs are close to the AMPERE fitted FAC in terms of the spatial coverage and location of the large scale FAC structures.



**Movie S1.** A movie showing the comparison between MAGE simulation results and DMSP F16, F17, and F18 measurements. The plot above is one frame used to illustrate the format. The left column shows comparison of horizontal ion drifts ( $V_{HD}$ ) and integrated electron precipitation energy flux (EnFlux) from DMSP F16, F17, and F18 measurements (black for all real measurements), and MAGE simulation results sampled along the DMSP trajectories, namely virtual F16 (green), virtual F17 (cyan), and virtual F18 (magenta). The red vertical dashed line indicates 11:25 UT, at which time the two-dimensional distributions of EnFlux, westward ion drifts (WID), and field-aligned currents and electrostatic potential are shown in the right column. The locations of DMSP F16, F17, and F18 satellites are indicated by the green, cyan, and magenta arrows in the right column. Plots of similar format are combined in Movie S1.