TITLE: Concerning the Perturbations Generated by Flux Transfer Events

PRESENTATION TYPE: Assigned by Committee (Invited)

SECTION: SPA-Magnetospheric Physics (SM)

SESSION: SM02. Advanced Modeling Methods for Dynamic Geospace Plasmas

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ABSTRACT BODY: The interaction of the solar wind with the Earth's magnetosphere is often highly unsteady. Bursts of magnetic reconnection at multiple locations on the dayside equatorial magnetopause generate flux transfer events or FTEs: twisted ropes of interconnected magnetosheath and magnetospheric magnetic field lines. Once formed, the events move antisunward, displacing and perturbing the ambient media. This talk explores the perturbations predicted by both global numerical simulations and analytical models. Results from global hybrid code simulation confirm the predictions of analytical models indicating that the events generate standing forward slow mode waves as their speeds relative to the magnetosheath flow approach the Alfvén velocity. Geometric considerations lead to the conclusion that events generated by component reconnection on the dayside magnetopause move poleward and exhibit strong signatures during intervals of southward IMF orientation, but move towards the flanks and exhibit weak signatures during intervals of northward IMF orientation. Changing event orientations and magnetosheath/magnetospheric magnetic field orientation can enhance the amplitudes of events reaching the flanks. Although the orientations of events on the flanks inferred from multispacecraft timing techniques are consistent with the predictions of the component reconnection model, occurrence patterns versus latitude and IMF orientation require an explanation in terms of both the component and antiparallel reconnection models.