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Magnetospheric response to interplanetary magnetic field and velocity fluctuations

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Multi-point measurements from solar wind, magnetotail and ionosphere will be analyzed to examine magnetospheric response to interplanetary magnetic field and velocity fluctuations. Phenomena of time scales from seconds to solar cycles will be covered. The role of both Alfvenic and non-Alfvenic magnetic field fluctuations will be covered. Southward interplanetary magnetic field is known to enable the magnetopause reconnection and allow interplanetary plasma to flow into the magnetosphere. Short duration driving of tens of minutes power single loading-unloading intervals, while long duration driving of several hours drive periodic magnetotail loading-unloading cycles. Most dramatic magnetospheric effects are caused by interplanetary coronal mass ejections (CMEs). However, the auroral region geomagnetic activity is best modulated by interplanetary high-speed streams (HSS). What happens in the magnetotail during CME and HSS driven cases is an open question we examine in this paper. We will furthermore discuss about the role of Alfvenic magnetic field fluctuations embedded to high-speed streams, in powering the auroral region.