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Solar Wind Dynamic Pressure Change and Magnetosphere-ionosphere Response

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We study the solar wind dynamic pressure change (increase/decrease) interaction with the magnetosphere using THEMIS satellites at both dayside and nightside in different geocentric distances. Vortices generated by the dynamic pressure change passing along the magnetopause are found and compared with model predictions. ULF waves and vortices are excited in the dayside and nightside plasma sheet when dynamic pressure change hit the magnetotail. The related ionospheric responses, such as aurora and TCVs, are also investigated. We compare Global MHD simulations with the observations.