ULF WAVES DRIVEN BY SOLAR WIND DISTURBANCES

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The solar wind supplies many kinds of disturbances in the magnetosphere. As the magnetosphere is a partly closed system, the solar wind disturbances excite many eigen oscillations in the magnetosphere as well as the waves directly penetrated from the solar wind. Bearing in mind that the eigen oscillations reflect the magnetospheric properties, the ULF waves driven by the solar wind can be regarded as probes for the magnetosphere. Although a satellite observation has been regarded to be inadequate for detection of the ULF waves with larger spatial scale and slow temporal variation, recently, thanks to some projects using coordinated flight of several satellites, we can investigate the in-situ ULF waves in the magnetosphere. In particular, the THEMIS satellite successfully detected the ULF waves in the dayside magnetopause [e.g., Glassmeier et al, 2008]. In addition, a numerical simulation technique has been introduced in the magnetospheric ULF wave study by using a realistic global MHD simulation [e.g., Motoba et al., 2007]. As the simulation offers us time-varying 3D grid point data, we can investigate in detail physical mechanisms of the ULF waves. In this talk, we mainly summarize recent simulation works of the ULF wave driven by the solar wind disturbance and compare the simulation results with observed one in the magnetosphere and on the ground.

MHD simulation, solar wind disturbance, ULF waves

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