

Title: Study of Electron-Scale Waves in the Earth's Magnetosphere

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The interaction between the solar wind and the geomagnetic field drives intricate plasma processes in the magnetosphere across various spatiotemporal scales. The complexity increases as the solar conditions vary with timescales less than seconds to hours. They trigger various plasma instabilities which are unstable to plasma waves at ion and electron scales. As the magnetospheric plasma is collisionless, these waves play a crucial role in the energy transfer between electromagnetic fields and different particle populations. Waves can act as catalysts or may dampen the ongoing magnetospheric process. In this talk, I will discuss electron-scale waves, associated instabilities, spatio-temporal characteristics, and some methods to study them using satellite data. The analysis is based on NASA's Magnetospheric Multiscale Mission (MMS) datasets.