

## Multi-scale Collisionless Reconnection and Kinetic Turbulence Based on Observations and Simulations

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Magnetic reconnection is a basic plasma physical process in space, astrophysics and Laboratory. With the topological change of magnetic field, magnetic reconnection can convert magnetic energy into plasma kinetic energy and thermal energy. Plasma turbulence usually contains multiple spatial scale current sheets, which can lead to particle heating, acceleration and turbulent energy conversion and dissipation. Recently there are progress of ion-coupled and electron-only reconnections, and the dynamics of turbulence in electron scale in both observations and simulations. Combining observations with computer simulations, this talk will present the results about the internal correlation among magnetic reconnection, plasma turbulence and coherent structure near diffusion region, and discuss the role of waves and dynamic turbulence in energy conversion and dissipation, multi-scale coupling and particle acceleration.

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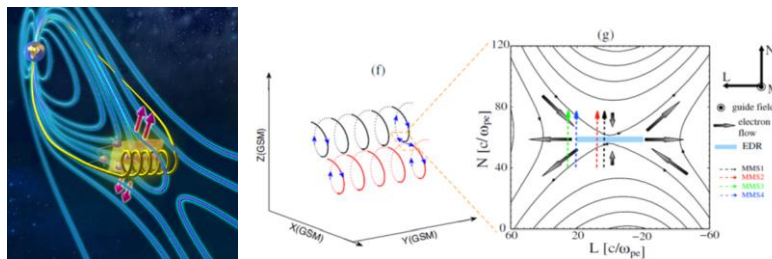


Figure 1 Flux ropes in electron scale near diffusion region.

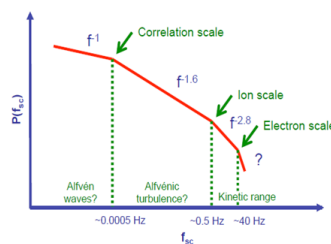


Figure 2 Multiple-scale spectrum of turbulence