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Spiro K. Antiochos
NASA/GSFC
Code 674
Greenbelt, MD 20771
spiro.antiochos@nasa.gov

Integrating Kinetic effects into Global Models for Reconnection

Magnetic reconnection is the most striking example of how the coupling between global and kinetic scales can lead to fast energy release. Explosive solar activity, such as coronal mass ejections and flares for example, is widely believed to be due to the release of magnetic energy stored on global scales by magnetic reconnection operating on kinetic scales. Understanding how processes couple across spatial scales is one of the most difficult challenges in all of physics, and is undoubtedly the main obstacle to developing predictive models for the Sun's activity. Consequently, the NASA Living With a Star Program selected a Focused Science Team to attack the problem of cross-scale coupling in reconnection. In this talk I will present some of the results of the Team and review our latest theories and methods for modeling the global-local coupling in solar reconnection.

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