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Kinetic Structures Associated with Asymmetric Magnetic Reconnection in MMS Observations BLAKE WETHERTON, JAN EGEDAL, University of Wisconsin-Madison, ARI LE, WILLIAM DAUGHTON, Los Alamos National Laboratory — Magnetic reconnection is inherently linked to the kinetic behavior of electrons as they decouple from the field lines in the electron diffusion region. As such, the kinetic evolution of the electron distribution function is of particular interest. In fact, elucidating these electron dynamics is a significant goal of NASA's current Magnetospheric Multiscale (MMS) mission, which is now taking measurements in the magnetopause reconnection region. The asymmetric nature of the magnetopause gives rise to interesting particle dynamics, such as seemingly agyrotropic crescent-shaped electron distribution functions that are observed by MMS spacecraft. Using data from kinetic simulations and MMS spacecraft, this study examines electron kinetic structures in asymmetric reconnection. A drift kinetic model is used to interpret electron distribution function data and identify structures of the reconnection geometry. In particular, it is found that most of the observed agyrotropic features can be accounted for by well-magnetized electrons in the framework of drift kinetic theory.

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