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Electron phase space structure of asymmetric reconnecting current sheets with varying guide fields OBIOMA OHIA, ARI LE, WILLIAM DAUGHTON, Los Alamos National Laboratory — Magnetic reconnection in asymmetric current sheets is known to produce highly structured electron velocity distributions, including crescents within the diffusion region [Bessho et al., GRL 2016] and crescents and mixed populations along the separatrices [Egedal et al., PRL (2016), Hesse et al., PRL (2017)]. Using a series of 2D particle-in-cell simulations of asymmetric magnetic reconnection with varying guide magnetic fields, we investigate electron distribution functions in both the upstream and exhaust regions of reconnecting current sheets. Electric fields, especially those parallel to the local magnetic field, play an important role in shaping and producing beams in velocity space. We relate the electron distributions to macroscopic field and plasma structures and compare our PIC results to recent Magnetospheric Multiscale (MMS) Mission measurements during dayside magnetopause reconnection.

Obioma Ohia
Los Alamos National Laboratory

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