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Kinetic Structure of the Electron Diffusion Region in Guide-Field Magnetic Reconnection BLAKE WETHERTON, JAN EGEDAL, UW-Madison, WILLIAM DAUGHTON, LANL — During magnetic reconnection the magnetic field decouples from the electrons' motion inside the electron diffusion region. Because this decoupling is necessary for magnetic reconnection to proceed, the structure of the diffusion region is of special interest. In the case of magnetic reconnection with a guide field, the role of pressure anisotropy and heat conduction in the electron distribution function has been studied through fluid models [1,2], but the detailed kinetic behavior of the electrons in the diffusion region is still not fully understood. By using data from kinetic simulations to track particles backwards in time from the reconnection region, the electron distribution function will be reconstructed in a similar method to that employed by Ng et al. in the case of anti-parallel magnetic reconnection [3]. The method will thus elucidate the connection between structures in velocity space balancing the reconnection electric field and the details of the electron motion.

[1] M. Hesse, et al., Phys. Plasmas, **11** (2004).
[2] M. Hesse, et al., Phys. Plasmas, **13** (2006).
[3] J. Ng, el al., PRL, **106** (2011).

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