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Super-Alfvénic energy transport during magnetic reconnection MICHAEL SHAY, University of Delaware, JAMES DRAKE, University of Maryland, JONATHAN EASTWOOD, Imperial College — The transport of energy away from a magnetic reconnection site is a critical problem for understanding many plasma systems. For example, the hard X-rays at magnetic field footpoints during a solar flare are believed to be due to energy propagated along magnetic field lines from the reconnection site. Similarly, the auroral signatures during substorms are related to energy transport away from reconnection in the magnetotail. In the substorm case, the time delay between reconnection onset and auroral brightening has in certain cases been found to be substantially shorter than the Alfven transit time, pointing to physics beyond MHD. Kinetic Alfven waves, however, can be much faster and could possibly explain the time lag. To test this possiblity, we simulate large scale reconnection events with the kinetic PIC code P3D and examine the disturbances on a magnetic field line as it propagates through a reconnection region. In the regions near the separatrices but relatively far from the x-line, the propagation physics is governed by the physics of kinetic Alfven waves and generates substantial Poynting flux sufficient to create aurora. Comparisons with Cluster magnetotail reconnection observations will be performed.

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