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Generation of superthermal electrons in single X-line reconnection[1] JAN EGEDAL, University of Wisconsin-Madison, WILLIAM DAUGHTON, Los Alamos National Laboratory — During magnetic reconnection, stress in the magnetic field is reduced and the process is often accompanied by an explosive release of magnetic energy. In the Earth's magnetotail, reconnection energizes electrons up to hundreds of keV, and in solar flare events a large fraction the released energy is channeled into the electrons, resulting in superthermal populations in the MeV range. In recent numerical and theoretical models, geometries with multiple reconnection sites have been studied in order to enhance the energy transfer to the electrons. Meanwhile, using a kinetic simulation, here we show that in low beta plasmas, electron energization occurs at large scales and with high efficiency in the exhaust of single X-line reconnection. Furthermore, the numerical electron heating spectra are consistent with those observed during solar flare events.

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Jan Egedal
University of Wisconsin-Madison

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