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Ion Energization During Macroscale Reconnection

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The computational model kglobal was developed to explore energetic particle production via magnetic reconnection in macroscale systems. It is based on the observation that the production of energetic particles during reconnection is controlled by Fermi reflection in large-scale magnetic fields and not by parallel electric fields localized in kinetic scale boundary layers. Earlier work with kglobal has produced the first self-consistent simulations of non-thermal electron acceleration during reconnection in a macroscale system. Although the original formulation of kglobal only treated the nonthermal energization of electrons, the equations can be extended to include ions as long as they remain magnetized so that a guiding center description remains valid. In this poster we discuss the appropriate extension of the kglobal equations and preliminary results from the simulations.

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