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Acceleration due to motional electric field in magnetic reconnection PATRICK KILIAN, FAN GUO, XIAOCAN LI, HUI LI, Los Alamos National Laboratory — In astrophysics magnetic fields can contain a large fraction of the overall energy budget of a system. When kinetic, non-ideal fields change the topology through reconnection this energy can be converted to plasma heating, kinetic energy in bulk flows and the production of non-thermal, highly energetic particles. We performed self-consistent kinetic simulations using VPIC to study particle acceleration in pair plasmas and find that the dominant mechanism of particle acceleration is not the localized non-ideal electric field at the reconnection site, but rather the ideal electric field induced by the plasma motion. This has implications for the particle spectrum and maximum attainable energy in astrophysical systems such as pulsar wind nebulae that are much larger than anything that can be simulated by kinetic simulations.

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