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Energy conversion by magnetic reconnection JOACHIM BIRN, Los Alamos National Laboratory, MICHAEL HESSE, NASA/Goddard Space Flight Center — The energy release and conversion by magnetic reconnection is discussed on the basis of magnetohydrodynamic (MHD) and particle-in-cell (PIC) simulations. Contrary to common assumptions, the energy conversion to enthalpy flux (convected heat) plays a major role, which typically exceeds the conversion to bulk kinetic energy flux. Direct Joule dissipation plays only a minor role in the energy release and transfer. These results are found consistently between PIC and MHD simulations, provided that the imposed resistivity is strongly localized or sufficiently small in magnitude. Approximate conservation of entropy on magnetic flux tubes is responsible for governing the structure of final equilibrium in closed systems.

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