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**Magnetic Reconnection and Anomalous Resistivity** R. KULSRUD, Center for Magnetic Self-Organization, Princeton University — Magnetic reconnection is often invoked in astrophysics to explain desirable properties of magnetic fields. For example, it is used to remove small scale fields in galactic dynamos, to generate jets by Taylor relaxation, and in the generation of fields for gamma ray bursts. However, most theories of reconnection lead to too slow a rate for these purposes. As Petschek has pointed out, the critical limiting process is the slowness of the mass outflow from the reconnection region. The only way around this seems to be to enhance outflow is by a funnel provided by a Petschek-like model which is based on slow shocks. An anomalous resistivity due to instabilities can vary rapidly in space and thus lead to shocks emerging from a short diffusion region. This process is explored based on the detection and analyis of a obliquely propagating lower hybrid drift instability. This instability has been detected in the MRX and prove to be strong enough to produce the anomalous resistivity that is measured there. A rate for the modified version of Petschek reconnection is derived and applied to the above mentioned astrophysical applications.

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