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Distribution of Plasmoids in Large Scale Magnetic Reconnection YI-MIN HUANG, A. BHATTACHARJEE, LIJIA GUO, University of New Hampshire — Recent theoretical and numerical studies show strong evidences that current layers in large scale magnetic reconnection events become unstable to a super-Alfvénic plasmoid instability. The reconnection layer changes to a chain of plasmoids connected by secondary current sheets which, in turn, may become unstable again. Eventually the reconnection layer will tend to a statistical steady state characterized by a hierarchical structure of plasmoids of various sizes. The hierarchical structure naturally suggests self-similarity across scales, which often leads to power-laws. In this work, the distribution function $f(\psi)$ of magnetic flux ψ in plasmoids is studied with resistive MHD simulations in high-Lundquist-number regime. The distribution function is found to follow a power-law $f \sim \psi^{-1}$. We propose an analytic phenomenological model that yields solutions consistent with the numerical findings. We compare the predictions of the model with observations from LASCO and TRACE of plasmoid distributions in post-CME current sheets.

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