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The plasmoid instability during asymmetric inflow magnetic reconnection NICHOLAS MURPHY, Harvard-Smithsonian Center for Astrophysics, CHENGCAI SHEN, JUN LIN, Harvard-Smithsonian Center for Astrophysics and Yunnan Astronomical Observatory — High Lundquist number current sheets have recently been found to be unstable to the formation of plasmoids. Numerical simulations of this instability have usually assumed that the reconnecting magnetic fields are symmetric. We therefore present resistive MHD simulations of the plasmoid instability during asymmetric inflow reconnection. Asymmetry in the upstream magnetic fields modifies the scaling, onset, and dynamics of this instability. Plasmoids develop preferentially into the weak magnetic field region. Outflow jets from individual X-lines impact magnetic islands obliquely rather than directly as in the symmetric case. Consequently, momentum deposition into the magnetic islands from the outflow jets is less efficient and outward advection of the islands is somewhat slower. The islands also develop net vorticity. Finally, we discuss the implications these simulations may have on the dynamics of the plasmoid instability in three dimensions.

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