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Scaling of Magnetic Islands with Applied Guide Fields in MRX[1]

H. LAZAR, M. YAMADA, H. JI, J. JARA-ALMONTE, C.E. MYERS, J. YOO, PPPL — Magnetic islands are thought to play a key role in magnetic reconnection. It has been observed that an increase in applied guide field promotes island formation and simultaneously decreases reconnection rate. Recently in the Magnetic Reconnection Experiment (MRX), a series of discharges were obtained to explore island formation under a variety of plasma conditions. In particular, the properties of the applied discharge were varied including (1) the guide field's strength; (2) the guide field's direction relative to the reconnection current; and (3) drive time. Flux plots and vector plots were used to locate and quantify the shape and size of the islands. The size and frequency of island formation is related to the properties of guide fields and reconnection rates.

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