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Plasma Formation from a Single Solid Conductor Carrying a Multi-Magaampere Current[1] MILENA ANGELOVA, BRUNO BAUER, IRVIN LINDEMUTH, VOLODYMYR MAKHIN, RICHARD SIEMON, University of Nevada, Reno — A number of pulsed-power experiments in which, multi-megaampere currents melt solid conductor surfaces and turn them into hot plasmas in a matter of microseconds or less, report on the critical impact the initial plasma formation process has on the characteristics of the entire discharge. This work investigates the features of the plasma formation in a single solid conductor carrying a multi-megaampere current by means of 2-D magnetohydrodynamic simulations. The simulations employ the state-of-the-art code MHRDR, and are performed for a wide range of conductor radii. An important challenge for modeling is to predict the plasma formation threshold and, the maximum magnetic field on the conductor surface that can be obtained prior to current disruption. The results of this study can be generalized to the more complicated problem of modeling a moving liner driven by a multi-megaampere current.

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