

Abstract Submitted
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3-D effects in magnetic reconnection of laser-produced plasma bubbles¹ W. FOX, F. MOLLICA, A. BHATTACHARJEE, K. GERMASCHEWSKI, Center for Integrated Computation and Analysis of Reconnection and Turbulence, University of New Hampshire — Recent experiments have observed magnetic reconnection in high-energy-density, laser-produced plasma bubbles. It is of great interest to extend previous 2-D simulations [1] to understand the full 3-D evolution of the bubbles. This 3-D evolution, studied by PIC simulations, includes the 3-D spherical expansion of the bubbles and 3-D geometry of the interaction, including the formation of isolated magnetic nulls and null-null lines. In cylindrical 3-D geometry, we study the dynamics of long-wavelength kink instabilities and short-wavelength lower-hybrid instabilities in the return currents, over a range of parameters characteristic of the experiments. Observational signatures of 3-D dynamics in the experiments will be discussed.

[1] W. Fox, A. Bhattacharjee, K. Germaschewski, Phys. Rev. Lett. **106**, 215003 (2011).

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