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Plasma-Jet Magnetized-Target Fusion Burn Dynamics JOHN F. SANTARIUS, Univ. of Wisconsin — In magnetized-target fusion (MTF), an imploding, conducting liner compresses a magnetized plasmoid, such as a spheromak or field-reversed configuration (FRC). The increasing magnetic field of the target reduces thermal conduction and the liner's inertia provides transient plasma stability and confinement. This poster explores the burn dynamics of using plasma jets to form the liner [1]. The investigation uses the University of Wisconsins 1 D Lagrangian radiation hydrodynamics code, BUCKY, which solves single-fluid equations of motion with pressure contributions from electrons, ions, radiation, and fast charged particles, using either ideal-gas or table-lookup equations of state. BUCKY includes ion-electron interactions, PdV work, and fast-ion energy deposition. For this research, the code has been extended to include the magnetic field evolution as the plasmoid compresses plus the dependence of the thermal conductivity and fusion product energy deposition on the magnetic field.
[1] Y.C. F. Thio, et al., "Magnetized Target Fusion in a Spheroidal Geometry with Standoff Drivers," in Current Trends in International Fusion Research, E. Panarella, ed. (National Research Council of Canada, Ottawa, Canada, 1999), p. 113.
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John F. Santarius
Univ. of Wisconsin

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