Abstract Submitted
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Plasma-Jet Magneto-Inertial Fusion Investigations[1] JOHN SANTARIUS, CAROL APLIN, University of Wisconsin — Several issues related to using plasma jets to implode a Magneto-Inertial Fusion (MIF) liner onto a magnetized plasmoid and compress it to fusion-relevant temperatures[1] are explored. One simple problem modeled is pure plasma jet convergence and compression without a target present. More elaborate cases with a target present explore how well the target's magnetic field reduces thermal conduction and the liner's inertia provides transient plasma stability and confinement. The investigation uses UW's 1-D Lagrangian radiation-hydrodynamics code, BUCKY, which solves single-fluid equations of motion with ion-electron interactions, PdV work, table-lookup equations of state, fast-ion energy deposition, and pressure contributions from all species. Extensions to the code include magnetic field evolution as the plasmoid compresses plus 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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