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Parameter Space for Plasma Liner Driven Magnetoinertial Fusion[1] SETH THOMPSON, JASON CASSIBRY, Propulsion Research Center, UAH, RON KIRKPATRICK, Los Alamos National Laboratory — Lindl-Widner diagrams are used in inertial confinement fusion for identifying the region in ρR-T parameter space in which heating power in the fusion target exceeds the power losses. These diagrams have been recently applied to magnetoinertial fusion (MIF). Typically, in MIF, a magnetized target is compressed by an imploding solid liner. In plasma-driven magnetoinertial fusion (PLMIF), a plasma liner compresses the target. PLMIF has some potential advantages including repeatable formation of the liner in a standoff manner and secondary fusion burn of the liner material. Following the basic approach in computation of MIF-based Lindl-Widner diagrams, we have extended these studies to PLMIF. We developed a new alpha deposition model from Monte Carlo simulations for spherical magnetized targets and a finite difference thermal conduction model for heat transfer from the target to the liner in order to construct the diagrams. The motivation for this study is two-fold. First, we use this approach to identify possible PLMIF ignition regions. Second, we investigate conditions in which the plasma liner may contribute significantly to the fusion burn power.

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