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Three dimensional calculation of thermonuclear ignition conditions for magnetized targets[1] ROSS CORTEZ, JASON CASSIBRY, University of Alabama in Huntsville, MICHAEL LAPOINTE, ROBERT ADAMS, NASA — Fusion power balance calculations, often performed using analytic methods, are used to estimate the design space for ignition conditions. In this paper, fusion power balance is calculated utilizing a 3-D smoothed particle hydrodynamics code (SPFMax) incorporating recent stopping power routines. Effects of thermal conduction, multigroup radiation emission and nonlocal absorption, ion/electron thermal equilibration, and compressional work are studied as a function of target and liner parameters and geometry for D-T, D-D, and ^{6}LI-D fuels to identify the potential ignition design space. Here, ignition is defined as the condition when fusion particle deposition equals or exceeds the losses from heat conduction and radiation. The simulations are in support of ongoing research with NASA to develop advanced propulsion systems for rapid interplanetary space travel.

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