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Status of Directly-Driven Shock Ignition Target Designs[1] ANDREW J. SCHMITT, STEPHEN OBENSCHAIN, Plasma Physics Division, Naval Research Laboratory, Washington DC 20375, STEVEN T. ZALESAK, Berkeley Research Associates, Beltsville MD 20705, DAVID FYFE, LCP&FD, Naval Research Laboratory, Washington DC 20375 — We report on the status of directly driven shock ignition targets designed for mega-joule scale laser drivers. We have examined the impacts of laser-plasma-instability (LPI) induced intensity limitations and hydrodynamic instability on the gain and robustness of these targets. Increasing the target's initial aspect ratio will limit the drive intensity prior to the ignitor pulse, but this can have a detrimental impact on the target hydrodynamic stability. Target robustness can be increased by strengthening the shock wave launched by the ignitor pulse. This igniting shock pressure will in turn depend upon the inevitable and as yet unpredictable laser-plasma instabilities generated during the high intensities ($I > 10^{16} W/cm^2$) required to generate the ignitor shock. We present simulation results of target performance in 1D and 2D that demonstrate the importance of the tradeoffs between LPI risk during compression and robustness due to hydrodynamic instability.

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