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**Assessing and improving the robustness of shock ignition targets**[1]

STEFANO ATZENI, A. MAROCCHINO, A. SCHIAVI, Dipartimento SBAI, Università di Roma La Sapienza and CNISM, Italy, M. TEMPORAL, ETSIA, UPM, Madrid — Shock ignition is a promising approach to inertial confinement fusion. Like fast ignition, it separates the stages of compression and ignition, but does not require ultraintense lasers. In addition, it may allow for relatively simple spherical targets. Here, we report studies concerning a simple all D-T target and a target with CH ablator, which could be tested at the National Ignition facility. They achieve (1D) gain in the range 60-100 at laser energy 0.5 – 1 MJ. These targets are driven by shaped laser pulses preceded by an an adiabat-shaping picket, which (according to our 2D simulations) is required to reduce both RMI and RTI growth at the ablation front. We have performed a wide 1D scan of performance sensitivity to changes in pulse shaping and target parameters (including initial temperature). By 2D simulations we have then studied how irradiation nonuniformities associated to the beam configuration, as well as to beam imbalance and mispointing and to target mispositioning degrade target performance. We discuss how robustness to such errors can be improved by optimizing beam configuration and target design.

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