

DIRECT-DRIVE STUDIES FOR THE LASER MEGAJOULE

B. Canaud¹, M. Temporal², W. Cayzac¹, G. Sary¹, V. Chardès¹,
A. Inglebert¹, V. Brandon¹, L. Gremillet¹, J.E. Sauvestre¹, R. Ramis³

¹*CEA, DAM, DIF, F-91297 Arpajon, France*

² *CMLA, ENS Cachan and CNRS, UniverSud, 61 avenue du Président Wilson, F-94235 Cachan Cedex*

³*ETSIA, Universidad Politécnica de Madrid, Spain*

We present a review of recent direct-drive studies done for the Laser MegaJoule. Specifically, 1D 300 μg -target designs are presented, parametrized by different initial aspect ratio (defined as the ratio of the inner DT-ice shell radius over its thickness). Laser pulse optimization leads to span peak implosion velocities and exhibit a velocity threshold that increases with the initial aspect ratio. Another point concerns kinetic aspects in hot spot. Ion species stratification and ion thermal decoupling is observed in Fokker-Planck calculations of deceleration stage and shock-ignition can restore the D/T equilibrium at the end. In addition, stochastic plasma cooling/heating is shown to be due to burning mechanism in analytical model and PIC simulations of a burning plasma.