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A short-pulse plastic-ablator implosion design for ignition on the Laser Mega Joule facility MARION LAFON, STEPHANE LAFFITE, RAPHAEL RIQUIER, CEA, DAM, DIF, F-91297 Arpajon, France, CEA TEAM — Recent work on ICF implosions at the National Ignition Facility (NIF) has focused on key optimizations relevant to plastic and high-density-carbon implosions. The final commissioning of the LMJ facility will use 40 quads to operate at full capacity. Because of inherent technical constraints, such as lower maximum energy and power, different laser beam balance and smaller phase plates than on NIF, a different configuration has to be investigated to reach ignition. Integrated 2D simulations have been performed using the TROLL radiation hydrodynamics code to guide for the first time a short-pulse plastic-ablator low-fill hohlraum design, given the laser energy/power available on LMJ. The trade-off between the P2 asymmetry, late-time inner beam propagation and the achievable peak velocity and performance is used to determine the optimal hohlraum shape, case-to-capsule ratio and laser pulse features (picket energy, foot drive and pulse length). These key parameters are also compared to recent NIF designs to assess the full potential of the LMJ design.

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