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Polar Direct Drive Shock Ignition Design on LMJ EDOUARD LE BEL, GUY SCHURTZ, XAVIER RIBEYRE, MARION LAFON, CELIA CEA — A low aspect ratio target family is designed in order to demonstrate the potential of ignition conditions of hydrogen isotopes on the LMJ by Shock Ignition without major modification of the facility i.e. for low laser induced damage on optics in the range of laser energy of 400-600 kJ. The shock ignition scheme is divided in two steps: first the compression of the fuel at low velocities and secondly the launch of strong shock allows to ignite the central hot spot. The presented work reports on the use of LMJ indirect drive laser hardware to compress the fuel at low implosion velocity in using a possible polar direct drive irradiation of the target. The ignition condition are produced from the launch of a bipolar strong converging shock by dedicated LMJ beams. A 1D robustness study is also performed with CHIC code for different target sizes and spike power and timing. The figure of merit is the bandwidth of the shock ignition window. We present a solution for a LMJ PDD laser illumination for the target compression and for the spike. We show first 2D CHIC simulations using this new PDD configuration. This strategy for implementation of PDD shock ignition on LMJ participate of a first proof of principle of shock ignition scheme in the frame of HiPER future reactor design.

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