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Richtmyer-Meshkov jet formation from rear target ripples in plastic and plastic/aluminum laser targets[1] Y. AGLITSKIY, Leidos, A.L. VELIKOVICH, M. KARASIK, V. SERLIN, J.L. WEAVER, A.J. SCHMITT, S.P. OBENSCHAIN, Plasma Physics Division, NRL — We report experimental observations of jets produced from the rear surface of laser targets after a passage of the laser-driven shock wave. As in our previous work, Aglitskiy et al., Phys. Plasmas (2012), the jets are produced via the shaped-charge mechanism, a manifestation of a Richtmyer-Meshkov instability for a particular case of the Atwood number A=-1. The experiments done on the KrF Nike laser facility with laser wavelength 248 nm, a 4 ns pulse, and low-energy drive regime that used only 1 to 3 overlapping Nike beams and generated ablative pressure below 1 Mbar. Our 50 um thick planar targets were rippled on the rear side with wavelength 45 μm and peak-to-valley amplitude 15 μm. The targets were made either of solid plastic or of aluminum with a 10 μm thick plastic ablator attached to avoid the radiation preheat. The jets were extremely well collimated, which made possible our side-on observations with monochromatic x-ray imaging. We saw a regular set of jets, clearly separated along the 500 μm line of sight. Aluminum jets were found to be slightly better collimated than plastic jets. A quasi-spherical late-time expansion of Al jets starting from the tips has not been previously seen in experiments or simulations.

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Yefim Aglitskiy
leidos

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