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Proton acceleration along the laser axis in a high contrast laser-matter interaction SYLVAIN FOURMAUX, JEAN-CLAUDE KIEFFER, HENRI PÉPIN, LJUBOMIR NIKOLIC, TUDOR W. JOHNSTON, Universite du Quebec INRS-EMT, Varennes J3X 1S2, Canada, DANIEL HOUDE, Universite de Sherbrooke, Departement de Medecine Nucleaire et Radiobiologie, Fleurimont, J1H 5N4, Canada — We have used the 10 TW ALLS laser system (300 mJ, 30 fs, 10 Hz) with frequency doubling to achieve high intensites on solid targets with high a contrast ratio laser pulse. The 400 nm laser pulse is focused at intensities between 10^{17}-10^{18} W/cm^{-2} and at an incident angle of 45° onto a 12 μm thick polyimide moving foil. Proton acceleration has been observed in front of and behind the foil surface. A maximum energy of 11 MeV is measured in the direction of the laser beam propagation. We discuss experimental results by using 2D PIC simulations. At the ALLS Canadian facility the new 200 TW laser system (5 J, 25 fs, 10 Hz) is currently starting operation. The laser high contrast ratio of 10^{10} at the 800 nm fundamental frequency combined with a high repetition rate of 10 Hz should allow us to produce 50 MeV protons with a high mean current.

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