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Effect of the Rayleigh-Taylor-instability on radiation-pressure-accelerated protons from solid-density hydrogen jets SEBASTIAN GOEDE, CHRISTIAN ROEDEL, MAXENCE GAUTHIER, WILL SCHUMAKER, MICHAEL MACDONALD, JONGJIN KIM, ROHINI MISHRA, FREDERICO FIUZA, SIEGFRIED GLENZER, SLAC National Accelerator Laboratory, KARL ZEIL, HANS-PETER SCHLENVOIGT, LIESELOTTE OBST, JOSEFINE METZKES, FLORIAN BRACK, RENE GEBHARDT, MARTIN REHWALD, PHILIPP SOMMER, STEFAN BOCK, UWE HELBIG, TOM COWAN, ULRICH SCHRAMM, Helmholtz Zentrum Dresden Rossendorf — Proton beams generated by relativistic laser-plasma interactions are of great interest in warm dense matter research due to applications such as isochoric heating and stopping power measurements. Radiation pressure acceleration (RPA) from pure hydrogen targets is a promising approach towards developing low emittance beams with high particle flux, one of the key requirements for above studies. We developed a novel target utilizing cryogenic hydrogen jets at solid densities for ion acceleration experiments. Using the 150 TW laser system DRACO at HZDR we measured pure proton spectra exceeding 10 MeV for peak intensities of $5x10^{20}$ W/cm^2 at a repetition rate of 1 Hz. The proton beam shows a net-like structure. The experimental results will be discussed with the support of particle-in-cell simulations to assess the impact of the Rayleigh-Taylor-instability on radiation-pressure-accelerated protons

Sebastian Goede
SLAC National Accelerator Laboratory

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