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Generation of narrow divergence electron beams in relativistic laser-plasma interactions[1] H. NAKAMURA, G. HICKS, Z. NAJMUDIN, Imperial College London, M. VRANIC, L.O. SILVA, Instituto Superior Técnico, M. BORGHESI, D. DORIA, SATYA KAR, G. SARRI, Queens University Belfast, R. HEATHCOTE, R. SCOTT, R. TRINES, E. GUILLAUME, Rutherford Appleton Laboratory, E. HIGSON, J. SWAIN, K. TANG, J. WESTON, P. ZAK, University of Oxford, K.A. TANAKA, Y. AMANO, H. HABARA, Osaka University, M. SKRAMIC, University of Cambridge, B. BINGHAM, University of Strathclyde Glasgow, P.A. NORREYS, Rutherford Appleton Laboratory and Oxford University — The evacuation of plasma from channels formed during the interaction of intense laser pulses with under-dense plasma is attractive for a number of applications, particularly fast ignition inertial fusion. We investigated the channel formation using proton radiography as the diagnostic tool. We observed the interactions of ultra-intense laser pulse (120J/ 15ps/ 1053nm) with a large scale-length plasma which was formed by the expansion of a plastic foil target by preheating with a laser pulse comprising 200J/ 1ns/ 527nm, focused to 400-diameter. This experiment was set-up to mimic the coronal plasma experienced during the compression phase of a directly driven implosion. The results showed that laser-induced electron beam were guided by self-generated magnetic field.

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