Abstract Submitted for the DPP12 Meeting of The American Physical Society

Electron transport and instabilities in laser plasma interaction BHUVANESH RAMAKRISHNA, Helmholtz Zentrum Dresden Rossendorf, KEVIN QUINN, The Queen's University of Belfast, LORENZO ROMAGNANI, LULI, École Polytechnique, CNRS, CEA, UPMC, 91128 Palaiseau, France, GIANLUCA SARRI, PUTHENPARAMPIL WILSON, MARCO BORGHESI, School of Mathematics and Physics, Queen's University Belfast, Belfast BT7 1NN, UK, OSWALD WILLI, Institut für Laser- und Plasmaphysik, Heinrich-Heine-Universität, D-40225 Düsseldorf, Germany, JULIEN FUCHS, Laboratoire pour l'Utilisation des Laser Intenses (LULI) CNRS-Ecole Polytechnique-Univ, Paris, Franc, LIVIA LANCIA, Laboratoire pour l'Utilisation des Laser Intenses (LULI) CNRS-Ecole Polytechnique-Univ, Paris, France, THOMAS COWAN, Helmholtz Zentrum Dresden Rossendorf — The propagation of laser-driven, relativistic electron beams in plasmas is a phenomenon of relevance in astrophysical scenarios, particularly concerning the problem of the generation of strong, spatially extended and sustained magnetic fields in astrophysical jets. We report on experiments where the transport of hot electron currents through foam has been studied using the proton imaging technique. Strong filamentation has been observed, possibly due to electromagnetic instabilities of the Weibel type. A multitude of tubelike filamentary structures is also observed to form behind the front of a plasma created by irradiating solid-density wire targets with a high-intensity ($I \sim 10^{19} \text{ W/cm}^2$), picosecond-duration laser pulse. These filaments exhibit a remarkable degree of stability, persisting for several tens of picoseconds, and appear to be magnetized over a length corresponding to several filament radii.

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Date submitted: 13 Aug 2012 Electronic form version 1.4