

Abstract for an Invited Paper
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Generation and Transport of Hot Electrons in Cone-Wire Targets¹

FARHAT BEG, University of California San Diego

We present results from a series of experiments where cone-wire targets in various configurations were employed both to assess hot electron coupling efficiency, and to reveal the source temperature of the hot electrons. Initial experiments were performed on the Vulcan petawatt laser at the Rutherford Appleton Laboratory and Titan laser at the Lawrence Livermore National Laboratory. Results with aluminum cones joined to Cu wires of diameters from 10 to 40 μm show that the laser coupling efficiency to electron energy within the wire is proportional to the cross sectional area of the wire. In addition, coupling into the wire was observed to decrease with the laser prepulse and cone-wall thickness. More recently, this study was extended, using the OMEGA EP laser. The resulting changes in coupling energy give indications of the scaling as we approach FI-relevant conditions. Requirements for FI scale fast ignition cone parameters: tip thickness, wall thickness, laser prepulse and laser pulse length, will be discussed. In collaboration with T. Yabuuchi, T. Ma, D. Higginson, H. Sawada, J. King, M.H. Key, K.U. Akli, Al Elsholz, D. Batani, H. Chen, R.R. Freeman, L. Gizzi, J. Green, S. Hatchett, D. Hey, P. Jaanimagi, J. Koch, K. L. Lancaster, D.Larson, A.J. MacKinnon, H. McLean, A. MacPhee, P.A. Norreys, P.K Patel, R. B. Stephens, W. Theobald, R. Town, M. Wei, S. Wilks, Roger Van Maren, B. Westover and L. VanWoerkom.

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