

Abstract for an Invited Paper
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Energy transport in laser-plasma interactions: a UK perspective

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A range of experimental and theoretical work has been performed recently to gain a greater insight into energy transport in laser plasma interactions. Experiments have been performed on the VULCAN Petawatt facility in the UK and the LULI2000 facility in France to look at energy transport as a function of a number of different parameters. The parameters studied range from the introduction of controlled pre-pulses, material properties / target geometry through to absorption as a function of density scale length. A wide range of diagnostics were used such as transverse shadowgraphy, rear-side optical emission imaging, X-ray imaging and spectroscopy, and streaked harmonic measurements. To support and stimulate this work, computational tools such as Vlasov-Fokker-Planck (LEDA,¹ K2²) and radiation hydrodynamic codes. One highlight that will be discussed in detail is the observation of changes to the beam divergence pattern with the addition of a cone-guide. Preliminary results from very recent studies conducted at the VULCAN facility to study the characterization and energy transport in warm dense matter in the context of the HiPER³ project will be presented.

¹A.P.L Robinson et al, Phys. Rev. Lett. 100 025002 2008

²K.L.Lancaster et al, submitted to Phys. Rev. Lett (K2 constructed by M. Sherlock)

³www.hiper-laser.org