Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

A new criterion to describe crossed-beam energy transfer in laser-plasma interactions R. TRINES, H. SCHMITZ, STFC Rutherford Appleton Laboratiory, UK, E.P. ALVES, F. FIUZA, SLAC, J. VIEIRA, L.O. SILVA, GoLP/IPFN, Instituto Superior Tecnico, Lisbon, Portugal, R. BINGHAM, STFC Rutherford Appleton Laboratiory, UK — Crossed-beam energy transfer (CBET) between laser beams in underdense plasma is ubiquitous in both direct-drive and indirect-drive inertial confinement fusion. To understand the impact of this process on the final shape of the laser beams involved, as well as their imprint on either hohlraum walls or target surface, a detailed spatial and temporal description of the crossing beams is needed. We have developed an analytical model and derived new criteria describing both the spatial structure and temporal evolution of the beams after crossing. Numerical simulations have been carried out justifying the analytical model and confirming the criteria. The impact of our results on present and future multi-beam experiments in laser fusion and high-energy-density physics, in particular the "bursty" nature of beams predicted to occur in NIF experiments, will be discussed.

Raoul M Trines
STFC Rutherford Appleton Laboratiory, UK

Date submitted: 15 Jul 2016 Electronic form version 1.4