

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Numerical and experimental analysis of plasma generated on a solid target by a multi-MeV electron beam THIERRY D'ALMEIDA, MAXIME RIBIERE, RMI MAISONNY, CEA — We quantitatively investigate the interaction of a high energy, high flux electron beam with a solid target based on an approach that combines numerical and experimental characterization. The experimental study is carried out diagnosing the interaction of a multi-MeV electron beam, delivered by the CEA ASTERIX high-pulsed power driver, with an aluminum-tantalum target. The numerical analysis builds upon results from Particle-In-Cell simulations, to reproduce the electron beam dynamics and characteristics, and Monte-Carlo simulations, to simulate the interaction of the electron beam with the solid target. The main plasma features emerging from this analysis are analyzed using a 1D radiative transfer model which enabled the experimental spectra to be reproduced numerically with a good consistency. From the numerical integration of the 1D radiative transfer equation, plasma characteristics such as electron temperature and density profiles, as well as ion densities of constitutive species, are determined.

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Date submitted: 12 Jul 2017

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