

Abstract Submitted  
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**Influence of the strong self-generated magnetic field on ion acceleration during laser-solid target interaction**<sup>1</sup> C.-K. HUANG, S. PALANIYAPPAN, J.C. FERNANDEZ, Los Alamos Natl Lab — The interaction of a high intensity laser with a low areal density solid target (including ultra-thin foils and low density foams) is often accompanied by laser breakout and strong longitudinal electron current channel at the backside of the target. The electron current can generate azimuthal magnetic field exceeding hundreds of MegaGauss, which plays an important role in the dynamics of the electrons near the focal volume or those surrounding the current channel. We present fully kinetic, relativistic Particle-In-Cell simulations that reveal the detail dynamics that lead to enhancement to the ion beam as electrons are magnetically trapped and then released when the laser exits the target. Comparison will be made with recent relevant experiments at the LANL Trident facility. We will also discuss how such interaction can be used to produce high energy ions with smaller energy spread and high conversion efficiency that may be useful for a number of applications.

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