

Abstract Submitted  
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**Investigation of self-induced transparency in laser-solid interaction**<sup>1</sup> BHOOSHAN PARADKAR<sup>2</sup>, UM-DAE Centre for Excellence in Basic Sciences, University of Mumbai, SERGEI KRASHENINNIKOV, FARHAT BEG, University of California, San Diego — Interaction of an intense laser beam with a thin ( $<$ laser wavelength) target in the radiation pressure acceleration (RPA) regime can lead to efficient acceleration of ions. In this regime, the electrons are strongly heated when the target becomes transparent to the incident laser. Therefore, understanding the role of this self-induced transparency (SIT) is crucial for controlling the quality of the accelerated ion beam. In this work, we present detailed numerical investigation of SIT using the 1-D and 2-D Particle-In-Cell simulations. In particular, threshold target thickness below which SIT is effective will be reported for the wide range of laser parameters such as intensity (normalize vector potential  $\sim 10-30$ ), pulse duration (10 – 100 fs) and polarization (linear/circular). The mechanism of SIT in both 1-D and 2-D simulations will be presented.

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<sup>2</sup>University of California, San Diego

Bhooshan Paradkar  
UM-DAE Centre for Excellence in Basic Sciences, University of Mumbai

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