Contribution ID: **48** Type: **Oral Presentation**

PIC simulation of scattering and absorption of an ultraintense short-pulse laser in a finite-size plasma

Wednesday, 13 July 2016 12:15 (20 minutes)

Abstract content
   (Max 300 words)
Formatting &
Special chars

The scattering and absorption of an intense, short-pulse laser in a relativistic under-dense plasma is investigated applying a fully kinetic 1D-3V particle-in-cell simulation code. The nonlinear phenomena related to the propagation of laser pulse in a finite-size under-dense plasma such as absorption and scattering have been studied in details. The results show that the laser pulse is depleted by the wake excitation at low plasma densities and the maximum laser absorption occurs at the phase-mixing time. We have expressed the explicit reasons for the anomalous behavior of the laser absorption rate in both magnetized and un-magnetized finite-size plasma. Studying the kinetic results associated with the distribution function of plasma electrons shows that in a special range of the plasma and laser parameters a large amount of laser energy is transferred to electrons to produce energetic electrons with bulk velocity in the laser direction. The obtained results in this paper have direct relevance to recent experiments on the intense laser–plasma interactions with applications to the particle acceleration, high energy particle production as well as the fast ignition concept.

Primary author: Dr KARGARIAN, Ameneh (Kharazmi University)

Co-authors: Dr HASANBEIGI, Ali (Kharazmi University); Prof. MEHDIAN, Hassan (Kharazmi University); Dr HAJISHARIFI, Kamal (Kharazmi University)

Presenter: Dr KARGARIAN, Ameneh (Kharazmi University)

Session Classification: Parallel Track A: Astrophysics and Space Physics, Plasma, Gravitation and Cosmology

Track Classification: Plasma Physics