Laser plasma interaction in the context of direct drive inertial fusion

Proposed in collaboration with ELI ERIC

Abstract: Laser plasma interaction is one of cornerstones of the inertial confinement fusion. The main objective of the target design is efficient delivery laser energy to the fusion target providing conditions favorable for symmetric implosion of the shell and ignition of fusion reactions at the moment of stagnation. Several processes are identified in the laser-plasma interaction context, which may result in spoiling homogeneity of laser energy deposition and consequently the shell implosion symmetry or reducing laser energy absorption and target compressibility. Although these processes have been studied for many years, their performance under the ICF conditions is not known and requires experiments at high energy laser facilities with multiple laser beams and plasmas having appropriate temperatures, densities, and scale lengths. The goal of this PhD project is to provide some responses to these high-level questions by analyzing data obtained on the laser facilities available, performing dedicated simulations and developing models.

Type of thesis: dissertation thesis

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