Mo-1.

The Extreme Light Infrastructure: Missions and Challenges

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ELI will be the first facility in the world dedicated to laser-matter interaction at unprecedented intensity levels. It will be also the first large scale infrastructure based in the eastern part of the European Community. It will explore ultrafast phenomena in the attosecond-zeptosecond domain and will be the gateway of a new regime in laser-matter interaction: the ultra relativistic regime that could reach into Nonlinear Quantum Electrodynamics, where vacuum polarization and elementary particle from vacuum can be produced. ELI's scientific mission will be a holistic investigation of the structure of matter, from atoms to vacuum. If the laser revolutionized atomic physics during the first fifty years, ELI in the same way could revolutionize nuclear physics. At the same time, it will also promote new technologies such as Relativistic Microelectronic with the development of compact laser-accelerators delivering very high-energy particles that could reach the 100GeV level and photon sources in the MeV regime. ELI will have a large societal benefit offering in medicine new radiography and hadron therapy methods. It will also considerably contribute to material science with the possibility to unravel and slow down the aging process in nuclear reactor and in the environment by offering new ways of identifying radioactive elements.

Mo-2.

Measuring the implosion symmetry on the NIF laser

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Indirect drive is used to implode capsules in cryogenically cooled hohlraums at the National Ignition Facility. One of the required conditions for successful implosion is spherical symmetry of the imploded capsule at peak compression. Instead of using ignition capsules with frozen D/T fuel, analog capsules called symcaps are used to study the hydrodynamic behavior of the implosion. The symcaps are imploded in hohlraums with the same size, gas fills, and hohlraum gas temperatures of an ignition hohlraums. Symcaps with gaseous fills of deuterium/helium fills are used to emulate the behavior of the ignition capsules. We will describe the technique[1,2] used to measure the symmetry of the implosion of symcaps, show some of the results of the measurements, how the technique was used to tune the symmetry of the implosion, and briefly discuss the extension of the technique to non-igniting capsules filled with mixtures of T/H/D gases.

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