COMPLEX INTERFEROMETRY FOR ELI

Research program 5: Laser plasma and high-energy-density physics

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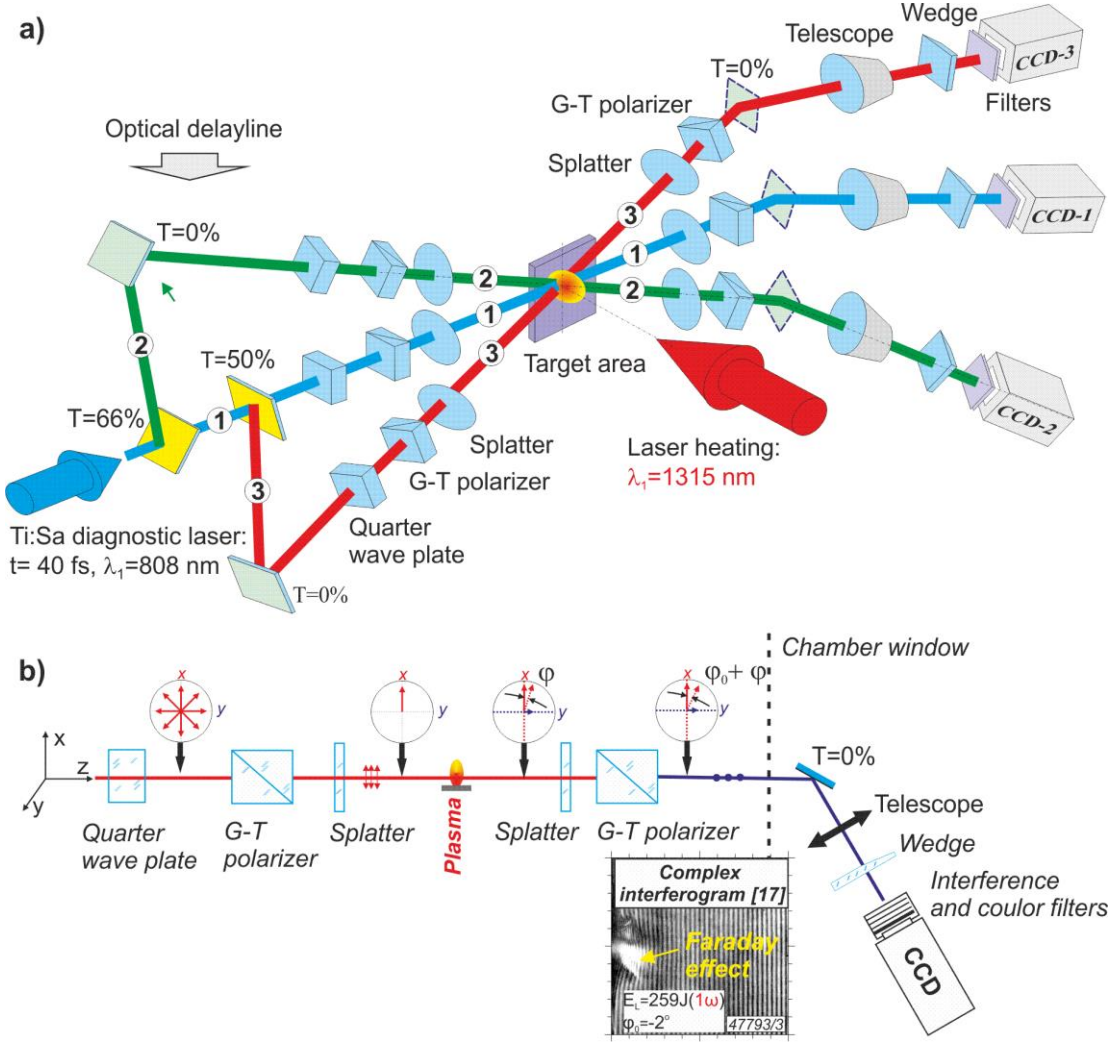
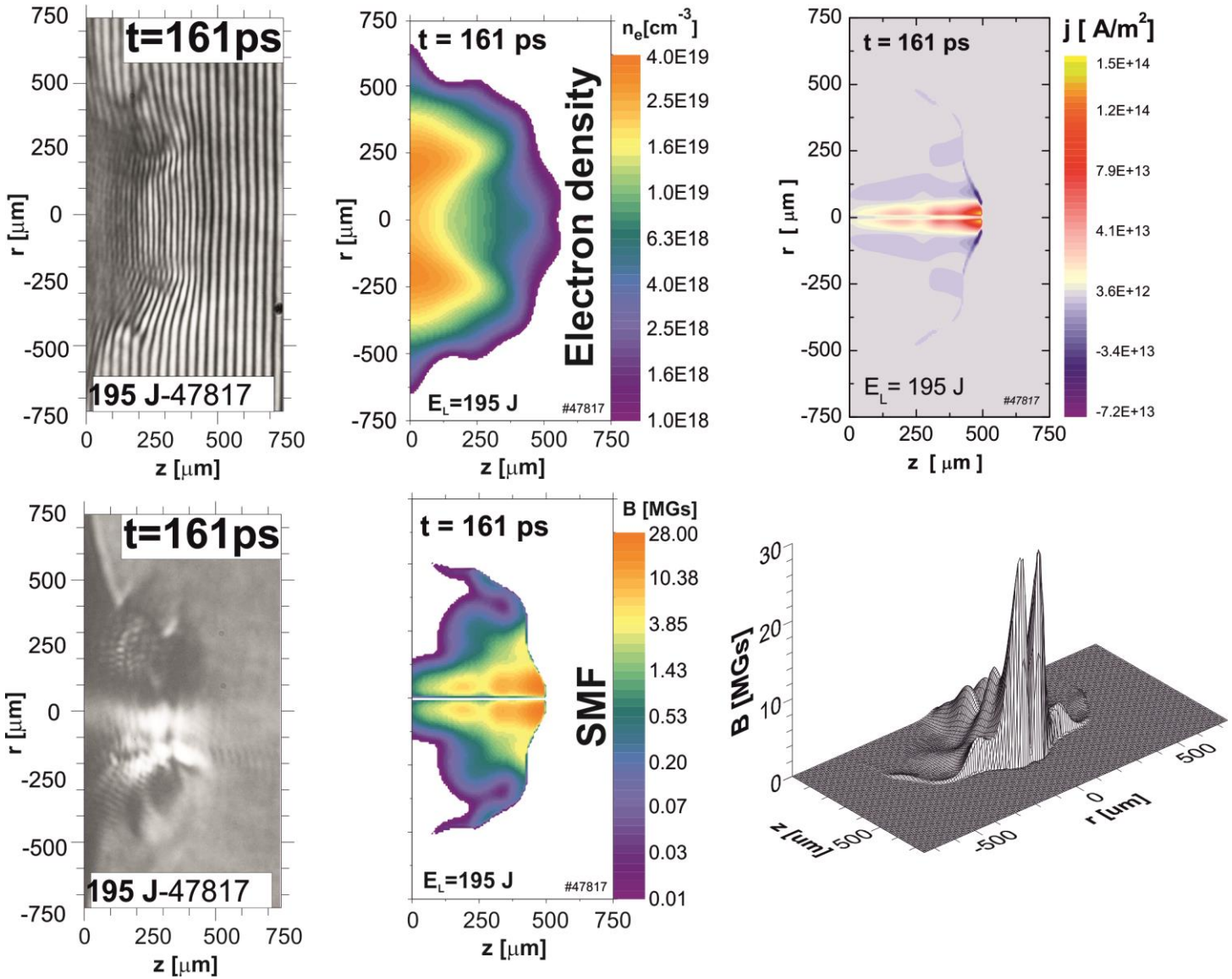
- The goal of this research program is development of experimental projects in the field of dense plasmas and in high energy density physics (HEDP).
- The *fast ignition* scheme of ICF targets assumes heating of a compressed target by a beam of laser-accelerated fast electrons or ions (*the latter may be generated in self-consistent fields of fast electrons*).
- The dominant mechanism of the spontaneous magnetic fields (SMF) generation refers to the generation of thermoelectric currents
- Therefore a need for studies of transport of high-current electron beams in dense plasmas rise.

- A unique diagnostic tool for the laser plasma research, in particular for studies of SMF and electron density distributions, would be a three-frame femtosecond polaro-interferometer, developed in the Institute of Plasma Physics and Laser Microfusion (IPPLM).

- The system will allow to register complex interferograms (interferograms with both phase shifts and amplitude modulation) for three different points in time, within one shot.

- Based on experience with use of one-channel polaro-interferometer, we are able to obtain distributions of electron density, SMF, electron currents with high spatial and temporal resolution.





Space-time distributions of the SMF obtained during the laser pulse interaction with targets (made from different materials) fully demonstrated usefulness of this diagnostic system for investigations of SMF in laser-produced plasmas

THANK YOU !