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Measurements of Spontaneous Magnetic Fields in Laser-Produced Plasma using Complex Interferometry

Spontaneous magnetic fields (SMF) are phenomena occurring in laser plasma that can affect the plasma density and temperature distributions, laser radiation absorption and ablation pressure. For this reason, knowledge about mechanisms of SMF generation is important in studies related to inertial confinement fusion as well as in astrophysical research.

The most reliable and efficient method for investigating the SMF is the method based on the magneto-optical Faraday effect, as it provides information on the SMF distribution in the entire area of investigated plasma, but requires simultaneous polarimetric and interferometric measurements. A particularly useful variant of this method is complex interferometry, which involves obtaining information about SMF directly from a phase-amplitude analysis of a complex interferogram.

During the lecture, the theoretical foundations of complex-interferometry will be discussed and the results of experiments using complex interferometry will be presented.

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