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Optimization of capacitor coil targets for generation of mega Gauss level magnetic fields using kJ-ns class lasers DEEPAK KUMAR, ELI Beamlines, COLLABORATIVE TEAM, The Queens University, Belfast. Institute of Plasma Physics and Laser Microfusion, Warsaw. Institute of Plasma Physics, Prague. — A controlled magnetic field is extremely useful in various laser plasma experiments, especially in the fields of fast ignition, laboratory astrophysics and charged particle beam lensing. MG level fields for such applications can be created by the interaction of a kJ-ns class laser with a capacitor-coil target. Previous experiments with such targets rely on the ablated plasma short circuiting the capacitor target, which causes a current to flow through the coil. In recently concluded experiments at the Prague Asterix Laser Facility we used the Iodine laser (600 J, 350 ps, $I\lambda^2 = 10^{16} - 10^{17}$ W/cm^2) with targets of varying capacitance designed so that the plasma did not short circuit the opposite plates. Such a design is also beneficial for future applications, where the magnetized targets are not affected by the ablated plasma. Spatial and temporal behavior of the magnetic field was inferred by measuring the Faraday rotation through a TGG crystal placed near the coil. A B-dot probe provided qualitative information on the timescale of evolution of current in the coil, and an electron spectrometer measured the distribution of the hot electrons. This talk will describe the experimental setup and the results of magnetic field measurement for various targets.

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