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**Measurements of Rayleigh-Taylor-Induced Magnetic Fields in the Linear and Non-linear Regimes**[1]

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Magnetic fields are generated in plasmas by the Biermann-battery, or thermoelectric, source driven by non-collinear temperature and density gradients. The ablation front in laser-irradiated targets is susceptible to Rayleigh-Taylor (RT) growth that produces gradients capable of generating magnetic fields. Measurements of these RT-induced magnetic fields in planar foils have been made using a combination of x-ray and monoenergetic-proton radiography techniques. At a perturbation wavelength of 120 $\mu$m, proton radiographs indicate an increase of the magnetic-field strength from $\sim$1 to $\sim$10 Tesla during the linear growth phase. A characteristic change in field structure was observed later in time for irradiated foils of different initial surface perturbations. Proton radiographs show a regular cellular configuration initiated at the same time during the drive, independent of the initial foil conditions. This non-linear behavior has been experimentally investigated and the source of these characteristic features will be discussed.

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