Abstract Submitted
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Magnetic Field Measurements in Wire-Array Z-Pinches[1] WASIF SYED, School of Applied and Engineering Physics, Laboratory of Plasma Studies, Cornell University, DAVID HAMMER, School of Electrical and Computer Engineering, Laboratory of Plasma Studies, Cornell University, MICHAL LIPSON, School of Electrical and Computer Engineering, Cornell University, ROBERT VAN DOVER, Department of Materials Science and Engineering, Cornell University, JON DOUGLASS, ECE, LPS, Cornell University — A method to determine the magnetic field in megampere level wire-array Z-pinches with high spatial and temporal resolution has not yet been developed. An ideal method would be passive and non-perturbing, such as Faraday rotation of laser light or emission spectroscopy. However, Faraday rotation measurements in Z-pinches suffer from severe difficulties, because density gradients are large and the plasma is magnetohydrodynamically turbulent inside the Z-pinches. Therefore, we are developing a method based on Faraday rotation through a sensing waveguide placed in the vicinity of, or perhaps in, a wire-array Z-pinch. We will also discuss emission spectroscopy methods based upon the Zeeman effect that are also under investigation. Finally, we will present a technique developed using magnetic CoPt thin films that measures a lower limit for the maximum magnetic field.

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