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Zeeman Spectroscopic Determination of Magnetic Field in Magnetized Plasma Expanding into Vacuum[1] JAY ANGEL, JOHN GREENLY, WILLIAM POTTER, JACOB BANASEK, DAVE HAMMER, Cornell University Laboratory of Plasma Studies — By passing a current through two wires perpendicular to a conducting surface a B-field that is largely parallel to the surface is created. UV light produced by the exploding wires creates a surface plasma on the conductor. Visible plasma emission is collected parallel to the magnetic field from along the surface to about 5 mm above the surface as the plasma expands. The light is split into left and right hand circularly polarized components, focused into two linear fiber bundles and delivered to a 750 mm spectrometer. The Zeeman components can resolve the peaks of the two polarizations even though the peaks show Stark Broadening. With this method, the magnetic field measures about 2.2 T 2-3 mm from the conductor surface, which is substantially lower than the estimated field at that distance. This method was developed for z-pinch experiments at the Weizmann Institute of Science (a Cornell Center collaborator) by G. Rosenzweig, E. Kroupp, A. Fisher and Y. Maron, "Measurements of the spatial magnetic field distribution in a z-pinch plasma throughout the stagnation process" JINST 12, P09004 (2017)

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