Abstract Submitted
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Plasma Formation and Evolution from Thick Metal Pulsed with Megagauss Magnetic Field[1] THOMAS AWE, BRUNO BAUER, STEPHAN FUELLING, RICHARD SIEMON, JASPREET BILLING, TASHA GOODRICH, University of Nevada, Reno, UNIVERSITY OF NEVADA, RENO TEAM — The threshold for plasma formation on the surface of thick metal, in response to a pulsed multi-megagauss magnetic field, is experimentally measured. Thick Aluminum rods with initial diameters ranging from 0.5 to 2.0 mm are pulsed with the 1.0 MA, 100-ns Zebra generator. Surface magnetic field rise rates vary from 30 to 80 MG per microsecond, with corresponding peak fields of 1.5 to 4 MG. The onset of thermal plasma is observed through an abrupt increase in the rate of surface heating when the surface temperature reaches about 0.7 eV. Plasma forms when the surface magnetic field exceeds 2 MG, independent of the rise rate of the applied field. High resolution (30 micron, 2 ns) images detail surface dynamics during this transition from warm-dense-aluminum to plasma. Measurements of magnetic field, brightness temperature, spectrum of emitted radiation, time of plasma formation, expansion velocity, and growth of instabilities are presented.

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