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EUV emission of warm dense plasma on an aluminum surface driven by a pulsed MG field[1] STEPHAN FUELLING, BRUNO S. BAUER, RICHARD E. SIEMON, THOMAS J. AWE, VOLODYMYR MAKHIN, TASHA GOODRICH, ANDREW OXNER, RADU PRESURA, University of Nevada, Reno
— Plasma formation on an aluminum surface in the vicinity of high pulsed magnetic fields is studied using the UNR 1 MA Zebra generator. This physics is important in a number of applications including magneto-inertial fusion. A variety of 1-mm diameter loads with different contact configurations were tested to minimize or inhibit plasma initiation due to contact arcing. The rod diameter was larger than the skin depth for the 70-ns current rise. The rods were monitored by an array of AXUV photodiodes with directly deposited filters to record plasma emissions in the extreme ultraviolet (EUV). Other diagnostics included optical imaging to a time-gated intensified CCD camera and a streak camera, magnetic field probes, photodiodes, photomultipliers, and laser schlieren and shadowgraphy. These yielded information on the threshold for plasma formation, the expansion of the aluminum, the temperature at the surface, and the growth of the unstable m=0 mode. The relatively simple experimental setup was chosen to allow comparison with 1-D and 2-D rad-MHD modeling.

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Stephan Fuelling
University of Nevada, Reno

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