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Plasma Formation on an Aluminum Surface Driven by MG Fields[1] STEPHAN FUELLING, BRUNO BAUER, RICHARD SIEMON, TOM AWE, VOLODYMYR MAKHIN, TASHA GOODRICH, ANDREW OXNER, RADU PRESURA, University of Nevada, Reno — Experiments on the UNR 1 MA Zebra generator drive magnetic fields of several megagauss on the surface of an aluminum conductor. This physics is important in a number of applications including magnetized target fusion. Several 1-mm diameter load designs were tested. The rod diameter was larger than the skin depth for the 70-ns current rise. Diagnostics included optical imaging to a time-gated intensified CCD camera and a streak camera, magnetic field probes, photodiodes, photomultipliers, and laser shadowgraphy, schlieren, and interferometry. 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 driven by the curvature of the magnetic field. Time-gated images show markedly more uniform light from machined loads than from wire loads. The relatively simple experimental setup was chosen to allow comparison with 1-D and 2-D rad-MHD modeling.

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