Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Interaction of relativistic magnetized electrons with obstacles[1]
BRANDON RUSSELL, PAUL CAMPBELL, KARL KRUSHELNICK, GENNADY FIKSEL, University of Michigan, PHIL NILSON, Lab for Laser Energetics, University of Rochester, LOUISE WILLINGALE, University of Michigan — Using a laser pulse from the OMEGA EP laser system focused to an intensity of $\sim 10^{19}\mathrm{Wcm}^{-2}$ we generate hot electron plumes on the surface of 25μm thick Al targets with high magnetization due to self-generated fields, given by $\sigma_{cold} = B^2/\mu_0 n_e m_e c^2 \approx 1$. These plumes expand at $\sim$c and interact with obstacles in the form of holes, or "blobs" of glue on the target. This interaction is probed using time-resolved proton radiography which allows for the measurement of fields in the plane of the target. The proton radiographs are analyzed using standard radiograph inversion codes and are compared to 2D and 3D particle-in-cell simulations.

[1]This material is based upon work supported by the Department of Energy / NNSA under Award Number DE-NA0003606. The authors would like to acknowledge the OSIRIS Consortium, consisting of UCLA and IST (Lisbon, Portugal) for providing access to the OSIRIS 4.0 framework. Work supported by NSF ACI-1339893.

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Date submitted: 02 Jul 2019 Electronic form version 1.4