

Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Magnetized jet creation using a hollow ring of laser beams
YINGCHAO LU, EDISON LIANG, LILY HAN, Rice University, LAN GAO, HAN-
TAO JI, Princeton University, CHI KIANG LI, RICHARD PETRASSO, MIT,
DUSTIN FROULA, RUSS FOLLETT, LLE Rochester, PETROS TZEFERACOS,
DON LAMB, U. of Chicago — We report results of magnetized jet creation ex-
periment using the Omega laser. Using 20 Omega beams to irradiate a flat plastic
target in a hollow ring pattern, we demonstrated that the on-axis electron and ion
density, temperature and velocity are higher than when all beams are focused onto
a single spot. The jet created by the hollow ring laser is also more collimated. Pro-
ton radiography was used to probe the magnetic field in the jet. Proton images
show ordered quasi-linear filaments whose divergence decreases with increasing ring
radius. Proton density contrasts are consistent with filamentary field bundles with
peak values in the tens of Teslas. These results demonstrate that magnetized jets
created by a hollow ring of laser beams can become a versatile new platform for
laboratory astrophysics.

Yingchao Lu
Rice Univ

Date submitted: 15 Jul 2016

Electronic form version 1.4