Abstract Submitted
for the FWS16 Meeting of
The American Physical Society

Investigation of laser induced plasma plume dynamics dependence on target geometry CUYLER BEATTY, AUSTIN ANDERSON, JEREMY IRATCABAL, University of Nevada, Reno, ERIC DUTRA, National Security Technologies LLC, Livermore, California, AARON COVINGTON, University of Nevada, Reno — Target geometry effects on plume dynamics have been investigated as part of an effort to develop cost-effective targets for upcoming neutron production experiments at the Nevada Terawatt Facility. Plastic targets were manufactured using different methods, including 3D printing, CNC machining, and vacuum casting. Preliminary target designs were made using a 3D printer and ABS plastic material. These targets were then tested using a 3 J laser with a 5 ns duration pulse. A 16-channel framing camera was used to record the plume shape and propagation speeds were determined from analysis of the images. The expansion of the laser plumes was shown to be dependent on the initial target geometry. Targets with a deep conical depression were shown to produce highly collimated plumes when compared to flat top targets. Preliminary results of these experiments will be discussed along with planned future experiments that will use the indented targets with a 30 J laser with a 0.8 ns duration pulse in preparation for pinched laser plume experiments at the Nevada Terawatt Facility.

Cuyler Beatty
University of Nevada, Reno

Date submitted: 06 Oct 2016 Electronic form version 1.4