Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Experimental studies of the effect target geometry on the evolution of laser produced plasma plumes. CUYLER BEATTY, AUSTIN ANDERSON[1], JEREMY IRATCABAL, University of Nevada, Reno, ERIC DUTRA, University of Nevada, Reno, National Security Technologies, LLC (NSTec), AARON COVINGTON[2], University of Nevada, Reno — The expansion of the laser plumes was shown to be dependent on the initial target geometry. A 16 channel framing camera was used to record the plume shape and propagation speeds were determined from analysis of the images. 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. 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. Other polymers that are readily available in a deuterated form will also be explored as part of an effort to develop a cost effective plasma plume target for follow on neutron production experiments.

[1]Dr. Austin Anderson
[2]Dr. Aaron Covington

Cuyler Beatty
University of Nevada, Reno

Date submitted: 15 Jul 2016 Electronic form version 1.4