Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

Laser-driven flyer plates for shock compression spectroscopy[1]
DANA DLOTT, WILLIAM SHAW, ALEXANDER CURTIS, ALEXANDR BANISHEV, University of Illinois at Urbana-Champaign — A laser-driven mini flyer plate system was developed for shock compression spectroscopy.[2] A commercial one-box 2J YAG laser produces a homogeneous top hat beam with a diffractive optic. An 8 GHz PDV characterizes flyer velocity profiles up to 5 km/s. Flyers are routinely launched with velocities reproducible to +\-1%, and the 1 mm diameter flyers have enough energy to initiate energetic materials. High-speed spectroscopic diagnostics have been synchronized. Design elements such as diameter, thickness, laser pulse duration, substrate size, and so on will be discussed. Illustrations will be presented, including monitoring shock front structures with embedded optical gauges,[3] and understanding mechanisms of reactive nanomaterial impact initiation.[4]

[1]Supported by ARO W911NF-10-1-0072, AFOSR FA9550-09-1-0163, DTRA HDTRA1-12-1-0011 and NNSA Carnegie-DOE Alliance Center DOE CIW 4-3253-13.
[2]K. E. Brown, W. L. Shaw, X. Zheng, and D. D. Dlott, Rev. Sci. Instrum. **83,** 103901 (2012).
[3]K. E. Brown, Y. Fu, W. L. Shaw, and D. D. Dlott, J. Appl. Phys. **112,** 103508 (2012).
[4]X. Zheng, A. D. Curtis, W. L. Shaw, and D. D. Dlott, J. Phys. Chem. C. (submitted 2012).

Dana Dlott
University of Illinois at Urbana-Champaign

Date submitted: 17 Jan 2013 Electronic form version 1.4