Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Thin liquid sheet target capabilities for ultra-intense laser acceleration of ions at a kHz repetition rate[1] ADAM KLIM, The Ohio State University , J. MORRISON , Innovative Scientific Solutions Inc., C. ORBAN , The Ohio State University, E. CHOWDHURY , Innovative Scientific Solutions Inc., The Ohio State University , K. FRISCHE , Innovative Scientific Solutions Inc., S. FEISTER, FLASH center for computational science, M. ROQUEMORE, Air-Force Research Laboratory — The success of laser-accelerated ion experiments depends crucially on a number of factors including how thin the targets can be created. We present experimental results demonstrating extremely thin (under 200 nm) glycol sheet targets that can be used for ultra-intense laser-accelerated ion experiments conducted at the Air Force Research Laboratory at Wright-Patterson Air Force Base. Importantly, these experiments operate at a kHz repetition rate and the recovery time of the liquid targets is fast enough to allow the laser to interact with a refreshed, thin target on every shot. These thin targets can be used to produce energetic electrons, light ions, and neutrons as well as x-rays, we present results from liquid glycol targets which are useful for proton acceleration experiments via the mechanism of Target Normal Sheath Acceleration (TNSA). In future work, we will create thin sheets from deuterated water in order to perform laser-accelerated deuteron experiments.

[1]This research was sponsored by the Quantum and Non-Equilibrium Processes Division of the AFOSR, under the management of Dr. Enrique Parra, and support from the DOD HPCMP Internship Program.

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Date submitted: 14 Jul 2017 Electronic form version 1.4