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Thin liquid sheet target capabilities for ultra-intense laser acceleration of ions at a kHz repetition rate[1] ADAM KLIM, Ohio State Univ - Columbus (OSU)/ University of Dayton Research Institute (UDRI), J.T. MORRISON , Innovative Scientific Solution, Inc. (ISSI), C. ORBAN , OSU, S. FEISTER, FLASH Center University of Chicago/ UDRI, G.K. NGIRMANG, J. SMITH, OSU, K. FRISCHE, ISSI, A.C. PETERSON, OSU/UDRI, E.A. CHOWDHURY, OSU/ Intense Energy Solutions, LLC., R.R. FREEMAN, OSU, W.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) water 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. We present results from liquid water 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.

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