

Abstract Submitted  
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**Enhancing Target Normal Sheath Accelerated Ions with Micro-structured Targets**<sup>1</sup> KEVIN GEORGE, JOSEPH SNYDER, LIANGLIANG JI, TREVOR RUBIN, ABRAHAM HANDLER, PATRICK POOLE, CHRISTOPHER WILLIS, REBECCA DASKALOVA, GINEVRA COCHRAN, DOUGLASS SCHUMACHER, Ohio State Univ - Columbus — Laser driven target normal sheath acceleration (TNSA) of ions has been widely studied due to its fundamental importance, use as a probe, and for possible applications such as cancer therapy and neutron generation. Much of this work has been conducted on thin foils with peak ion energy and yield optimized using laser parameters such as energy and spot size. Micro-structured targets, however, have demonstrated increased peak ion energy and yield by controlling and enhancing mechanisms preferential to TNSA. Novel micro-structured targets were developed using optical lithography techniques on thin substrates at the OSU NanoSystem Laboratory. Variable structure height (0.5-2 micron) and transverse patterning (up to 1 micron resolution) permit the survey of a range of structured target variables in the study of ion acceleration. We describe the development of these targets and an experiment investigating the enhancement of TNSA ions from lithography produced micro-structured targets conducted at the Scarlet Laser Facility. Experimental results show increased proton and Carbon yield >2 MeV and higher peak Carbon energy from structured targets.

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Kevin George  
Ohio State Univ - Columbus

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