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Maximizing Deuteron Yields of Deuterated Titanium TNSA Targets Toward Generating a High-Yield Tritium Beam ARNOLD SCHWEMMLEIN, University of Rochester, CHAD FORREST, WALTER SHMAYDA, JAMES KNAUER, SEAN REGAN, CHRISTIAN STOECKL, Laboratory for Laser Energetics, UDO SCHROEDER, University of Rochester — First experiments were conducted on the Laboratory for Laser Energetics' Multi-Terawatt (MTW) laser to produce a deuteron beam by target normal sheath acceleration (TNSA) using deuterated Ti targets. Commercial 20-μm-thick Ti foil was cut into 500 500 μm^2 squares and exposed to atomic deuterium at different temperatures ranging from 60C to 350C and pressures from 0.1 mTorr to 300 mTorr. An alternative loading method of condensing a titanium-deuterate layer onto the Ti foils was also examined. The MTW laser emitting at 1053 nm was operated in high-energy (24-J), short-pulse (8-ps) mode to produce an on-target intensity of 3 10^{18} W/cm^2. Using a Thomson-parabola ion spectrometer, the energy spectra and total yields of all relevant ion species were determined as a function of deuterium loading. These experiments represent pilot studies for an experimental platform under development at this laboratory to generate a tritium beam on its more-powerful OMEGA EP laser. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856.

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