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Selective Deuteron Acceleration and Neutron Production on the Vulcan PW Laser[1] A.G. KRYGIER, Ecole Polytechnique/Ohio State University, J.T. MORRISON, Air Force Research Laboratory, R.R. FREEMAN, Ohio State University, H. AHMED, J.A. GREEN, A. ALEJO, S. KAR, Queens University, L. VASSURA, Ecole Polytechnique — Fast neutron sources are important for a variety of applications including radiography and the detection of sensitive materials. Here we report on the results of an experiment using the Vulcan PW laser at Rutherford Appleton Laboratory to produce a nearly pure deuterium ion beam via Target Normal Sheath Acceleration. The typical contaminants are suppressed by freezing a μm's thick layer of heavy water vapor (D_2O) onto a cryogenic target during the shot sequence. Neutrons were generated by colliding the accelerated deuterons were into secondary targets made of deuterated plastic in the pitcher-catcher arrangement. Absolute yields for deuterium ions and neutrons are reported.

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