Neutron production using deuterited palladium wires

ERIK MCKEE, TIM DARLING, BEN HAMMEL, NTF, NTF COLLABORATION — The Zebra 1-MA/100ns rise time pulse power generator (HDZP-II) was initially designed to pinch single extruded wires of frozen deuterium in an effort to achieve fusion ignition [1], however solid thin-wire loads are now the main target. In general, the load for production of neutrons is a 4-wire, 20μm palladium wire in X-pinch configuration treated with deuterium gas. The generation of neutrons on Zebra are not from realization of Lawson’s criterion [2], but rather are produced through beam-like collisions in MHD sausage-like instabilities with large and local electric fields. This project builds on the wire-array knowledge accumulated at NTF and we report on a reproducible, pulsed neutron source with yields exceeding $10^9$.