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Development of Neutron Diagnostics for 1 MA Z-Pinch¹ CHRISTOPHER THOMAS, AARON COVINGTON, TIMOTHY DARLING, University of Nevada, Reno, MATERIAL PHYSICS TEAM — The causal relationship between properties of a solid Z-pinch target is acknowledged theoretically but has been difficult to verify experimentally. We are using a unique target system, palladium metal with internally stored hydrogen or deuterium as a variably-modified target with significant diagnostic emission advantages over pure elements or nearequal mass component alloys. The neutrons from d-d interactions in the deuterium loaded samples provide a new window into the effects of instabilities and the properties of two-component plasmas. The main experimental components of this work include the construction of a unique target processing system and the development of a new Z-pinch plasma neutron diagnostic capability. The development and calibration of these neutron detectors will be presented along with preliminary data from Z-pinch experiments.

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