

Abstract Submitted  
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**Plasma-Filled Rod-Pinch Diode for HEDLP Research<sup>1</sup>** ANDREW RICHARDSON, BRUCE WEBER, STEPHEN SWANEKAMP, JOSEPH SCHUMER, Naval Research Laboratory, NINO PEREIRA, Ecopulse, JOHN SEELY, Berkeley Research Associates, DAVID MOSHER, Engility — This poster describes recent progress on research into using the plasma-filled rod-pinch (PFRP) at the Naval Research Laboratory (NRL) for warm dense matter (WDM) studies. The objective of this project is to utilize the PFRP diode and associated diagnostics to experimentally quantify the pressure, temperature, and ionization state via independent measurements in WDM comprised of ionized high- $Z$  materials (tungsten). Previous experiments and preliminary results show that the parameters of the PFRP plasma are approximately  $Z = 17$ ,  $\rho_m = 0.7 \text{ g/cm}^3$ ,  $T = 30 \text{ eV}$ ,  $P = 16 \text{ Mb}$ , and  $\Gamma = 35$ . The experiments and simulations currently underway will allow for more accurate determination of these parameters, which will contribute to an enhanced understanding of these high- $Z$  materials in a WDM state. To achieve this objective, new diagnostics are being developed and current diagnostics are being refined, experiments are being performed, and numerical modeling is being carried out. This project will refine a new technique for producing WDM that can be replicated on pulsed power generators at several US universities and government laboratories, provide data for benchmarking numerical analysis codes, and develop diagnostics that should prove useful on many other WDM sources.

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