

Abstract Submitted  
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**Experimental Tests of Quasiparticle Plasma State Momentum Distribution Predictions in Metal-Hydrides** DAVID KOLTICK, YEONG KIM, Purdue University — An experiment is proposed to search for power law fall off of the momentum distribution of protons in a metal hydride at equilibrium temperatures near the proton interstitial binding energy. A  $p^{-8}$  power law falls off is predicted at scales  $pc/kT > 10$  to 100 by Galitskii and Yakimets [1] and Kim and Zubarev [2], using calculations based on quasiparticle plasma state calculations. Similar behavior is observed in high energy hadronic particle distributions at scales  $P_{\perp}/m_{\pi} \sim 10$  to 100. The experiments scatter a pulsed beam of thermal neutrons from a metal-hydride target at  $\sim 1000^{\circ}$  K. The experimental signature for power law tails is the uniform angular scattering of the neutron beam to higher energies in the 10 eV and higher energy range. The experiment is designed to search for quasiparticle like behavior to a level of  $10^{-10}$ .

1. V.M. Galitskii and V.V. Yakimets, J. Exp. Theoret. Phys. (U.S.S.R.) **51**, 957 (1966).
2. Y.E. Kim and A.L. Zubarev, Japanese J. of Applied Physics **45**, L552 (2006); **46**,1656 (2007).

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