

Abstract Submitted  
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**Interaction of relativistic laser pulses with near-critical density plasma**<sup>1</sup> L. WILLINGALE, C. ZULICK, F.J. DOLLAR, A. MAKSIMCHUK, Z. ZHAO, University of Michigan, G.J. WILLIAMS, H. CHEN, A.U. HAZI, E. MARLEY, LLNL, W. NAZAROV, University of St Andrews — We perform fundamental studies using the relativistic-intensity Titan laser (LLNL) interacting with very low-density foam targets, to study a near-critical density plasma. The interactions are characterized through simultaneous measurements of electron and proton spectra and beam divergence, the reflected and transmitted optical light and the generated x-ray radiation. Trends with plasma density are cross-correlated across different diagnostics to investigate the transition electron heating mechanisms and channeling behavior. Two dimensional particle-in-cell simulations are performed to give better physical understanding of these phenomenon.

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Louise Willingale  
University of Michigan

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