Abstract Submitted
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Ultra high energy density plasmas generated by highly relativistic laser nanowire interactions[1] REED HOLLINGER, Y. WANG, S. WANG, A. ROCKWOOD, J. GLASBY, V. SHLYAPTSEV, J.J. ROCCA, Colorado State University, M.G. CAPELUTO, Universidad de Buenos Aires, V. KAYMAK, A. PUKHOV, Heinrich-Heine-Universitat Dusseldorf — The interaction of high aspect ratio, ordered nanowire arrays with clean, ultrashort laser pulses of relativistic intensity provides a unique combination of nearly complete optical absorption and increased light penetration into near solid density matter. Previous experiments have shown that irradiation of Ni and Au nanowires at intensities of $5x10^{18}Wcm^{-2}$ generate multi-keV, near solid density plasmas in which the ionization state reaches Ni^{+26} and Au^{+52} charge states[1] at depths of $5\mu m$ suggesting the creation of volumetrically heated matter[2]. Here we present the first results of the irradiation of Ag nanowire arrays with highly relativistic laser pulses of intensities up to $5x10^{21}Wcm^{-2}$. Time integrated x-ray spectra show the presence of He-like and Li-like emission. Results of experiments conducted with a variety of different nanowire diameters will be presented and compared to three dimensional particle in cell (3D-PIC) simulations. [1]Purvis et al Nature Photonics 7, 769 (2013). [2]Bargsten et al Sci. Advances Vol. 3 No. 1 (2017)

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