Abstract Submitted
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**X-ray emission from femtosecond laser irradiation of vertically aligned nanowires**[1] VYACHESLAV SHLYAPTSEV, MICHAEL PURVIS, REED HOLLINGER, CLAYTON BARGSTEN, AMY PRIETO, Colorado State University, ALEXANDER NOY, JIANFEI ZHANG, University of Merced, ALEXANDER PUKHOV, Heinrich-Heine University Duesseldorf, JORGE ROCCA, Colorado State University — We are experimentally and theoretically studying the generation of bright x-ray pulses in volumetrically heated plasmas created by intense femtosecond laser pulse irradiation of vertically aligned nanowire arrays. The scheme we utilize allows us to achieve homogeneous volumetric heating of near-solid density targets to simultaneously achieve almost 100 percent laser absorption efficiency and low hydrodynamic losses, resulting in very hot plasmas at near-solid density which are strong x-ray emitters. Experiments conducted irradiating nickel nanowires 35-55 nm diameter with sub-100 fs duration laser pulses at intensities up to 7x10$^{18}$ Wcm$^{-2}$ show the generation of very hot plasmas in which the ionization reaches the He-like stage and strong x-ray emission. The experimental results are compared with PIC simulations and atomic physics calculations.

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