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Evolution of Elastic X-ray Scattering in Laser-Shocked Warm Dense Li NATHAN KUGLAND, University of California, Los Angeles, GIANLUCA GREGORI, University of Oxford, SUJIT BANDYOPADHYAY, Rutherford Appleton Laboratory, CERI BRENNER, University of Strathclyde, COLIN BROWN, Imperial College, The Blackett Laboratory, CARMEN CONSTANTIN, University of California, Los Angeles, SIEGFRIED GLENZER, Lawrence Livermore National Laboratory, FIDA KHATTAK, Kohat University of Science and Technology, ANDREA KRITCHER, CHRIS NIEMANN, University of California, Los Angeles, ANKE OTTEN, Technical University of Darmstadt, JAMES PASLEY, University of York, ALEX PELKA, MARKUS ROTH, Technical University of Darmstadt, CHRIS SPINDLOE, Rutherford Appleton Laboratory, DAVE RILEY, Queen's University, Belfast — Li foils were heated and compressed using shock waves driven by 4 ns long laser pulses. Separate 1 ns long laser pulses were used to generate a bright source of 2.96 keV Cl Ly-α photons for near-elastic x-ray scattering. Comparison with radiation hydrodynamics simulations shows that the plasma is highly coupled during the first several nanoseconds, then relaxes to a moderate coupling state at later times. Our main finding is that the near-elastic scattering amplitudes are quite sensitive to the mean ionization state $\overline{Z}$, and by extension to the choice of ionization model in the radiation-hydrodynamics simulations used to predict plasma properties within the shocked Li.

Nathan Kugland
University of California, Los Angeles

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