#90

Measurement of line absorption at Gbar pressures

David Bishel[1], Igor Golovkin[2], David Chin[1], Ethan Smith[1], Gilbert Collins[1], John Ruby[3], Phil Nilson[1], Reuben Epstein[1], Ryan Rygg[1], Suxing Hu[1]

[1] *Laboratory for Laser Energetics, University of Rochester, USA*
[2] *Prism Computational Sciences, USA*
[3] *Department of Physics and Astronomy, University of Rochester, USA*

Atomic structure profoundly impacts the material and radiative properties of dense plasmas. Accurate atomic models are critical to understanding the structure and evolution of stellar interiors, inertial fusion plasmas, and traditional and nuclear explosives. Even at a few times solid density, however, interactions between neighboring ions in a plasma may substantially modify the atomic wavefunctions. Calculations of these many-body quantum interactions are exceedingly difficult, requiring approximations to be made in most atomic structure models, yet few datasets exist to verify their accuracy. We present inner-shell x-ray absorption spectra of mid-Z witness layers in a laser-driven spherical implosion compressed to Gbar pressures. We map the energy shift of inner-shell transitions during disassembly and the relationship to the evolving thermodynamic conditions. Impacts on atomic structure models are discussed.

Presenting Author Email Address: *dbishel@ur.rochester.edu*