Calculation of Optical Properties of Plasmas using the Linear Response Formalism in the Average Atom Model

N.M. Gill*[1], C.E. Starrett*

*Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM, 87545, USA

The average atom model provides a useful formalism for the calculation of equation of state and other properties of warm dense matter. One such property of interest is the opacity of dense plasmas. In condensed matter systems, it is common to determine the frequency-dependent linear response of the system electrons in order to calculate the opacity and other properties. This formalism makes use of time-dependent density functional theory to determine the response of system electrons to external perturbations. We adapt that formalism for use with the average atom model for the purpose of calculating optical properties of warm dense systems.

[1]Email: ngill@lanl.gov