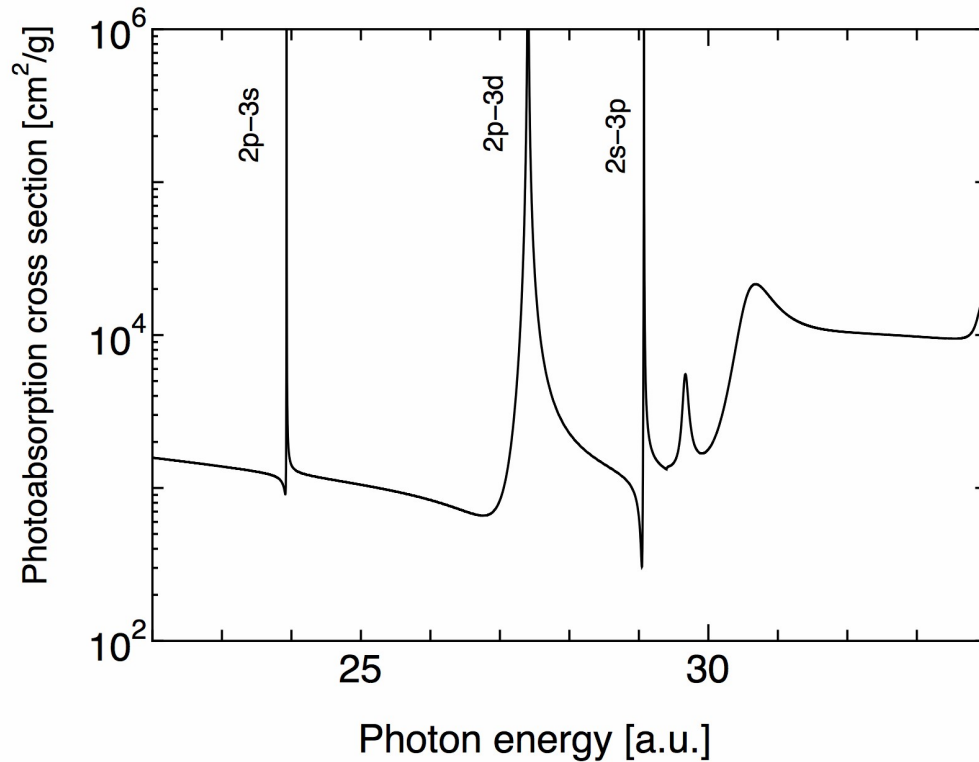


Atomic processes in hot dense plasmas

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Photoabsorption cross section of hot dense Fe plasma

In the hot dense plasmas such as the inertial confinement plasmas, the interior of stars, it is important to understand the thermal properties of the matters as well as the atomic properties of them. For these matters, the thermal properties such as ion-ion correlation and the atomic one such as the spectral properties, electronic states, the level occupation number of electron, the charge state distribution are highly correlated. The average atom model or the finite temperature density-functional theory (FTDFT) has been employed vigorously to study the equation of state (EOS), photoabsorption, transport coefficients like opacity, and so on, where the LTE plasma is assumed. We have been studying the photoabsorption cross section of the hot dense plasmas by means of time-dependent density-functional theory, where the electronic structure is determined by employing relativistic Kohn-Sham equation.

Keywords : Hot dense plasmas, density functional theory, average-atom model