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# Scattering processes and stopping power in dense plasmas

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Knowledge of the energy loss of ions in ionized matter is important for both fundamental physics and applied research in inertial confinement fusion (ICF) [1-4]. Inertial thermonuclear fusion requires qualitative and quantitative descriptions of the interaction of heavy particles with matter in a wide range of densities and temperatures. In this paper scattering processes, Coulomb logarithm and stopping power in a dense plasma are considered taking into account the quantum mechanical diffraction effect and the screening effect separately and together. The quantum diffraction effect is taken into account by using the quantum potential [5-6], whereas the dynamic screening effect is taken into account by simple rescaling of the screening length [7]. One of the most important parameters describing the energy loss of ions in plasma is the Coulomb logarithm. The formula $\lambda = Ln\Lambda$ for the Coulomb logarithm is used in various research areas, including ICF, dusty plasma, plasma processing of materials, etc. However, this formula does not correctly account for collision processes and does not take into account quantum effects in the systems [8-9]. In this work the Coulomb logarithm is obtained on the basis of effective potentials [10-11]. The results obtained in this work for the stopping power are compared with the results of other theoretical methods and computer simulations [12-13].

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