

## THE CALCULATION OF THE PHOTO ABSORPTION PROCESSES IN DENSE HYDROGEN PLASMA WITH THE HELP OF CUT-OFF COULOMB POTENTIAL MODEL

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**Abstract.** Extensive work was done in the application of a cut-off Coulomb model on the description of the optical processes of the photo ionization and inverse bremsstrahlung. Presented work deals with a usage of a cut-off Coulomb model pseudo potential for the calculation of the optical absorption process in dense hydrogen plasma as a entirely quantum mechanical process. Although the mentioned processes are strongly influenced by the collective process in dense plasma, the used pseudo potential enables to model the described interaction with the plasma system as a binary process. There are several advantages of such approach; the existence of the exact analytical solutions for the wave functions in the described potential enables to eliminate one of the several sources of numerical error. Also, more complex processes of the interaction inside plasma could be considered, and they have been added in presented work. The work on description of such processes has been started. The collective phenomena of the plasma are here described as an additional shifting and broadening of a bond states levels. Furthermore, with the adding of mentioned broadening and additional shifting of the bond states as free external parameters the good agreement between the analyzed experimental data and our model solutions occurs. The method of determination of the cut-off radius was developed and applied in our considerations. The presented model is a good approach for the description of dense hydrogen plasma of moderate and high non-ideality. It presents an easily extendable model, in which is easy to introduce additional processes and effects.