ОБЪЕДИНЕННЫЙ ИНСТИТУТ ЯДЕРНЫХ ИССЛЕДОВАНИЙ Лаборатория теоретической физики им. Н. Н. Боголюбова



Семинар «МАЛОЧАСТИЧНЫЕ СИСТЕМЫ»

вторник, 15 января 2013 г., 11:00 аудитория II этажа

DETERMINATION OF THE ENERGY SPECTRUM OF THREE-BODY COULOMB SYSTEM WITH RELATIVISTIC CORRECTIONS

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On the basis of the investigation of asymptotic behavior of correlation functions of the corresponding field currents with the corresponding quantum numbers the analytic method for the determination of the energy spectrum of the three-body Coulomb system is suggested. Within this framework the analytical approach to determine the energy spectrum of the molecular hydrogen ions in the ground and orbital excited state is used. In our case, relativistic corrections are taken into account by the constituent mass of the constituent particles, as well as by the interaction potential. Our results show that the masses of the constituent particles differ from the masses of the particles in the free state. The constituent mass of the electron differ between for the molecular ions of hydrogen H_2^+ , D_2^+ , T_2^+ , HD^+ , DT^+ , and HT^+ . Thus, our results on the energy spectrum of molecular hydrogen ions in the ground and excited states show good agreement with the existing results of precision spectroscopy; this is achieved by taking into account the values of the masses of constituent particles.