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Two and three dimensional study of the hydrogen molecular ion H_2^+ confined between double boxes of spheroidal and spherical geometries. MARTIN MOLINAR, GERMAN CAMPOY, Departamento de Investigacion en Fisica, Universidad de Sonora — Considering first a two-dimensional system, we study the hydrogen molecular ion confined in the space between two ellipses, and then we consider its confinement in the space between two prolate spheroids. In the Born – Oppenheimer approximation, we solve numerically the Schrodinger’s equation for the above mentioned cases, using an algorithm that allows us to calculate the energies for different given values of the confinement parameters. We also consider the confinement in the region limited by two concentric circumferences and in the three-dimensional case, in the region between two concentric spherical shells. In the last two cases we use the variational method in order to estimate the energy of the ground state. Some properties of the system as the pressure exerted by the confinement, the polarizability in the approximations of Kirkwood and Buckingham and the energies of the vibrational states are calculated. The behavior of the internuclear separation is analyzed for all the geometries considered.

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