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Two-Electron Systems in Generalized Exponential Cosine Screened Coulomb Potentials KARINA V. RODRIGUEZ, Universidad Nacinal del Sur, Bahia Blanca, Argentina, LORENZO UGO ANCARANI, Universite de Lorraine, Metz, France, DARIO M. MITNIK, IAFE, Buenos Aires, Argentina
— We look at the ground state of two-electron systems placed in a dense quantum plasma environment where the three interactions between two particles of charges z_i and z_j placed at a distance r_{ij} can be described by exponential-cosine-screened Coulomb potential (ECSCP) [1] $V(r_{ij}) = z_i z_j \exp(-\lambda r_{ij}) \cos(\delta r_{ij})/r_{ij}$ where λ and δ are two positive real screening parameters related to the plasma frequency. The first calculations of the ground and first excited states of H^-, He and Li^+ where all three interactions between pairs of particles were represented by the same ECSCP, and with $\lambda = \delta$, were recently reported [2,3]. In the present work we show results for two-electron systems for which the interactions are described by generalized ECSCP with unequal parameters. Our calculations are performed with a rather versatile Configuration Interaction approach (see [3] and references therein), with correlated basis functions which explicitly depend on the three interparticle distances and which respect exactly all three cusp conditions.

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