

Variational Monte Carlo Calculations of Spherically Confined Atoms in plasma environment

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Abstract

The ground state energy of hydrogen and helium atom confined by a hard prolate spheroidal cavity is calculated in the presence of plasma environment. The effect of compression as well as the presence of plasma environment on the energy of hydrogen and helium in ground state is studied in details. The plasma effect is taken care of by employing effective screening of the Coulomb potential. The Schrodinger equation is solved using the variational Monte Carlo method with an accurate trial wave function depending on many variational parameters. The results were extended also to include He-like isoelectronic ions up to $Z = 10$. Our results are compared with the most recent accurate values. The obtained results are in good agreement with the most recent results.

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