

Shannon, R\'enyi, Tsallis entropies of $1s^2$ -State Atomic System

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Abstract

The Shannon, R\'enyi, and Tsallis entropies of normalized electron density in position and momentum spaces are studied for the $1s^2$ state of Helium-isoelectronic series. Within single-zeta β -type orbitals (β TOs), the Hartree-Fock-Roothaan (HFR) calculations are considered and condensed on the most features of the physical results. The information quantities with atomic number deal with the interactions between the core and valence regions of the atom and thus enhance a geometrical understanding for the difference. It is assumed that the presented result might be a significant reference for further research topic on theoretical information quantities of atomic and molecular. Indeed, Our results have a good agreement in comparison with the previous published results.

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