

GLOBAL QUANTUM INFORMATION-THEORETIC MEASURES IN THE PRESENCE OF MAGNETIC AND AHARANOV-BOHM (AB) FIELDS

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ABSTRACT

The global quantum information-theoretical analysis of the class of Yukawa potential (CYP) in the presence of magnetic and Aharanov-Bohm (AB) fields has been examined both analytically and numerically in this research piece. The energy equation and wave function for the CYP are obtained by solving the Schrodinger equation in the presence of external magnetic and AB fields using the functional analysis technique. The probability density is used to calculate the Tsallis, Renyi, and Onicescu information energy entropies numerically. The influence of the screening parameter (β), magnetic (\vec{B}), and AB (ξ) fields on the global information-theoretical measurements for the CYP is explored. Atomic and molecular physics, quantum chemistry and physics are specific areas that this research findings will find application.

Keywords: Magnetic and AB fields; Onicescu information energy, Renyi entropy, Shannon entropy, Class of Yukawa Potential, Tsallis entropy