

Morse potential in noncommutative quantum mechanics framework

ABSTRACT

Morse potential is one of the well-known exact solvable potentials which attracts many applications in quantum mechanics especially in quantum chemistry. Unlike harmonic potential, Morse potential describes more accurate results on the interaction of diatomic molecules. This work proposes noncommutative quantum mechanics framework of Morse potential in two-dimensional system. A set up of the Morse potential in terms of its Hamiltonian, generalized commutation relations, deformed ladder operators and their associated energy eigenvalues in noncommutative phase space are highlighted. Discussion on the relation to the case of noncommutative harmonic case is also presented.

Keyword: Morse potential; Noncommutative quantum mechanics; Operator method