

An investigation of relationships between the usual Quantum Harmonic Oscillator and its one-parameter family version

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We study Hamiltonian of one-parameter family yielding the Newton equation. In particular, we are interested in its prescription for quantum harmonic oscillator. A modified perturbation theory is used to evaluate the spectra and the eigenfunctions of the Hamiltonian. Spectra we obtain seem to agree with those of the usual Hamiltonian. We also study this Hamiltonian with additional term αx^4 to get the Newton's equivalent anharmonic oscillator Hamiltonian. Our spectrum depend on the one-parameter family.

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