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Exactly solvable model of a damped harmonic oscillator affected by magnetic field in a time dependent noncommutative space

Tuesday 13 December 2022 14:00 (1 hour)

In this work, we focus on how to find out the exact solutions of a time dependent model of a damped harmonic oscillator affected by an external time varying magnetic field with a time dependent noncommutativity. The well known method of Lewis invariant associated with a non-linear differential equation, known as Ermakov-Pinney (EP) equation in literature, is chosen to treat the system. Then it is observed that some explicit solution set of EP equation enable us to get a series of exact analytic form of the eigenfunctions for some specific choices of the damping factor, the time dependent frequency of the oscillator and the time dependent external magnetic field. Finally, we also can establish the explicit expressions of the energy expectation values corresponding to each exact solution and show their dynamics graphically.

Session

Formal Theory

Authors: DUTTA, MANJARI (S.N.Bose National Centre for Basic Sciences); Dr GANGULY, Shreemoyee (University of Engineering and Management); Dr GANGOPADHYAY, Sunandan (S.N. Bose National Centre for Basic Sciences)

Presenter: DUTTA, MANJARI (S.N.Bose National Centre for Basic Sciences)

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