2ND EUROPEAN PHYSICS CONGRESS

May 20-21, 2019 | Berlin, Germany

On the frequency function for stronger squeezing degree and the exact algebraic solution for the quantum harmonic oscillator with variable frequency

D M Tibaduiza[1], L Pires[1], C Farina[1], C A D Zarro[1], D Szilard[2] and **A L C Rego[3]**
[1]Federal University of Rio de Janeiro, Brazil
[2]The Brazilian Center for Research in Physics, Brazil
[3]State University of Rio de Janeiro, Brazil

We obtained an exact algebraic solution for the quantum harmonic oscillator with variable frequency in a closed form. This allows us to implement a numerical calculation to study the dynamics of the system. It is shown that for any frequency function, the instantaneous state of the system is a squeezed one of the initial Hamiltonian. Once the final state is found, is mandatory to analyse the models that maximize the squeezing degree. We present a discussion by comparison the Janszky-Adam scheme, where the frequency modulation accounts through sudden changes between two stable frequencies, and the parametric resonance model, where the frequency modulation accounts through a harmonic function. In such analyses new aspects of the problem are elucidated.

danielmartinezt@gmail.com