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Quantum mechanical treatment of a constrained particle on two dimensional sphere

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Abstract

In this work, we study the motion of a particle on two dimensional sphere. By writing the Schrodinger equation, we obtain the wave function and energy spectra for three dimensional harmonic oscillator potential plus trigonometric Rosen-Morse non-central potential. By letting three special cases for intertwining operator, we investigate the energy spectra and wave functions for Smorodinsky-Winternitz potential model.

Keywords: Quantum mechanics, Motion on a sphere, Three dimensional harmonic oscillator potential, Trigonometric Rosen-Morse non-central potential, Intertwining method, Smorodinsky-Winternitz potential.

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