

Lewis-Riesenfeld quantization and $SU(1,1)$ coherent states for 2D damped harmonic oscillator


Latévi Lawson, Gabriel Avossevou and Laure Gouba

Institut de Mathématiques et de Sciences Physiques (IMSP), Bénin

The study of dissipative systems have remained over the past years a constant source of fascination, inspiration and innovation in different branches of sciences. The study of this in quantum physics framework has been criticized for violating certain laws of quantum theory. Thus, in this paper we tackle these issues and we provide a simple and complete solution for this problem in

two dimensions. To do so, we use the algebraic method of operators based on the Lewis-Riesenfeld invariant procedure. Finally, from the solution of the Schrodinger equation of this system, we derive the generators of $SU(1,1)$ Lie algebra and we construct the corresponding coherent states and study the related proprieties.

e: lawmenx@gamil.com

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