Chithiika Ruby, V.; Senthilvelan, M.
On the construction of coherent states of position dependent mass Schrödinger equation endowed with effective potential. (English) Zbl 1310.81054
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Summary: In this paper, we propose an algorithm to construct coherent states for an exactly solvable position dependent mass Schrödinger equation. We use point canonical transformation method and obtain ground state eigenfunction of the position dependent mass Schrödinger equation. We fix the ladder operators in the deformed form and obtain explicit expression of the deformed superpotential in terms of mass distribution and its derivative. We also prove that these deformed operators lead to minimum uncertainty relations. Further, we illustrate our algorithm with two examples, in which the coherent states given for the second example are new.

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MSC:
81Q05 Closed and approximate solutions to the Schrödinger, Dirac, Klein-Gordon and other equations of quantum mechanics
81R30 Coherent states
81U15 Exactly and quasi-solvable systems arising in quantum theory
81Q80 Special quantum systems, such as solvable systems

Keywords:
ladder operators; deformed superpotential

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