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Reviewer: Znojil, Miloslav

Reviewer number:

Address:
NPI ASCR, 250 68 Rez,
Czech Republic
znojil@ujf.cas.cz

Author: Urdaneta, Ines; Sandoval, Lourdes; Palma, Alejandro

Short title: On the algebraic approach to the time-dependent quadratic Hamiltonian.

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Review text:

In a very elementary exercise the authors consider the superposition of P^2 and Q^2 with the respective time-dependent coefficients $\alpha^2/2$ and $\beta^2/2$ and call it the time-dependent quadratic Hamiltonian (TDQH). The same operator may be re-expressed in terms of the usual time-independent annihilation and creation operators a and $a^\dagger$ of course. By the time-dependent harmonic oscillator (TDHO) the authors mean again the same Hamiltonian operator expressed in terms of the (ad hoc, tilded) time-dependent creation and annihilation operators. The other set b and $b^\dagger$ of the time-dependent annihilation and creation operators is finally introduced via Bogoliubov transformation mediated by the Wei-Norman system-evolution operator $U(t)$ expressed as a product of three exponentials. Its three parameters g_j with $j = 1, 2, 3$ are finally expressed in terms of α and β. Two well known solvable examples are recalled for illustration.