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Review text:

Comprehensive review of a few most fascinating properties of the quasi-exactly solvable sextic anharmonic oscillator in quantum mechanics, accompanied by a few really very nice and inspiring pictures. Unfortunately, one misses here heavily several key references. Thus, the fundamental wave-function ansatz as summarized in chapter 2 should have been attributed to V. Singh, S. N. Biswas and K. Datta and in particular to section II. C. "Exact polynomial solutions of the problem" of their pioneering paper "Anharmonic oscillator and the analytic theory of continued fractions" published in Physical Review D 18, Nr. 6, pp. 1901 - 1908 (1978). Similarly, chapter 3 on hidden symmetry does not in fact add anything new to my own results on "Polynomial potentials and hidden symmetry of the Hill-determinant eigenvalue method" which appeared in Physics Letters A 116 (1986) 207 - 209. Similarly, chapter 4 on semiclassical quantization also does not mention its predecessors (I would recommend that the authors cite some recent papers by C. M. Bender et al at least). Finally, by my opinion, any paper on partial solvability of sextic oscillators should not have skipped the marvelous monograph "Quasi-exactly solvable models in quantum mechanics" by Alex Ushveridze (IOP Publishing, Bristol, 1994, ISBN 0 7503 0266 6).