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**Review text:**

Although the Hamilton-Jacobi equation could provide an intellectually satisfactory alternative formal background for quantum theory, formidable difficulties emerge during the process of solution of its operator nonlinear partial differential form. There exist ways of circumventing this difficulty (cf., e.g., M. Roncadelli and L. S. Schulman, Phys. Rev. Lett. 99, 170406 (2007)) revealing specific merits of the approach. In particular, the action variable can be used to find the exact bound-state energy levels of a quantum system without solving the equation of motion for wave functions themselves (ref. [28]). Yeşiltas and Sever illustrate this possibility using several versions of Morse and Pöschl-Teller exactly solvable potentials in their real as well as complex forms.