

Entangled State Representation for Hamiltonian Operator of Quantum Pendulum

FAN Hong-Yi^{1,2}

¹ Department of Physics, Shanghai Jiao Tong University, Shanghai 200030, China

² Department of Material Science and Engineering, University of Science and Technology of China, Hefei 230026, China

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Abstract: By virtue of the Einstein-Podolsky-Rosen entangled state, which is the common eigenvector of two particles' relative coordinate and total momentum, we establish the bosonic operator version of the Hamiltonian for a quantum point-mass pendulum. The Hamiltonian displays the correct Schrödinger equation in the entangled state representation. The corresponding Heisenberg operator equations which predict the angular momentum-angle uncertainty relation are derived. The quantum operator description of two quantum pendulums coupled by a spring is also derived.

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