RESONANCE AND REVIVALS IN QUANTUM ROTORS: COMPARING HALF-INTEGER SPIN AND INTEGER SPIN

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Quantum rotor wavefunctions based upon Wigner-D matrix are applied to investigate the quantum resonance and revivals that occur in experimentally accessible spin systems. Interesting physical effects in quantum rotors between half-integer spin and integer spin systems will be discussed to show effects of symmetry. This study will pave the way for more rich dynamic behaviors in asymmetric top that include dynamic tunneling between various equivalent energy surface topography for asymmetric quantum rotors.
A key point is that the quantum revivals in the rotor systems exhibit number-information aspects of surprisingly simple Farey-sum and Ford-circle geometry. Such quantum dynamic might have applications for quantum information processing and quantum computing.