Alterntive Description of Rigid Body Kinematics and Quantum Mechanical Angular Momenta

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ABSTRACT

We investigate an alternative two-axes decomposition method for three dimensional rotations proposed in our earlier research. It is shown to provide a convenient parametrization for many important physical systems. As an example, the kinematic dynamical equations of rigid body motion are considered in some specific cases. The corresponding quantum mechanical angular momentum and Hamiltonian are obtained as well with the aid of infinitesimal variations. Curiously, the coeficients in this new representation happen to depend only on one of the decomposition angles.