

EQUATIONS OF MOTION FOR STRUCTURES
IN TERMS OF QUASICOORDINATES

Appears in the
Journal of Applied Mechanics
Vol. 57, No. 3, pp.745-749
September 1990

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ABSTRACT

A form of Lagrange's Equations in terms of quasicordinates (Boltzmann/Hamel equations) is presented. Identities are introduced which permit a straightforward formulation of the equations of motion for structures for which the kinetic and potential energies are functions of angular velocity and orientation. The formalism is presented in matrix form and may be used if the energies are expressed in matrix form as explicit functions of angular velocities and coordinate transformation matrices. This method is particularly useful for a large class of problems in the dynamics of structures including spacecraft, robots, ground vehicles and aircraft.

