Linear, Rotational and Vibrational KInetic Energies Must Be Included in Mass-Energy Calculations STEWART BREKKE, Northeastern Illinois University (forner grad student) — All bodies have no motion, have linear, rotational and/or vibrational motion, singly or in some combination. Curvilinear motion is linear motion influenced by an external force field. The total energy of a body therefore must include the linear rotational and vibrational kinetic energies if present besides just the mass-energy conversion which may reconcile experimental data with theory even though these extra energies may be very small in comparison. If k is a force constant, x is the amplitude of vibration and omega is the angular speed, the formula for E zero is as follows.

$$E_0 = m_0 c^2 + 1/2 m_0 v^2 + 1/2 I \omega^2 + 1/2 k x_0^2$$

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