

Abstract Submitted  
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**Some Early 20th Century Physics Formulas Must Add A Rotation And A Vibration Factor Correcting Their Omission Because Their Existence Was Not Known Upon Discovery** STEWART BREKKE<sup>1</sup>, Northeastern Illinois Univ — A number of early 20th century formulas must be slightly corrected because since about 1960, all matter has been found to exhibit rotation, vibration as well as linear motion then not known. Einstein derived the total energy at slow speeds to be  $E = mc^2 + 1/2mv^2$ . However, adding rotation and vibration factors is now needed.  $E = mc^2 + 1/2mv^2 + 1/2I(\omega)^2 + 1/2kx^2$  His Photoelectric Effect equation must also include these factors.  $hf = (1/2mv^2 + 1/2I(\omega)^2 + 1/2kx^2)max + \phi$ . In complete and partial transfer of energy in Bremsstrahlung the resulting total photon energy must now be  $hf = 1/2mv^2 + 1/2I(\omega)^2 + 1/2kx^2$  for complete braking achievement of the charged particle. Also, in pair production and annihilation total energy calculations must include rotation and vibration kinetic factors. Many other early physics formulas may possibly need the rotation and vibration factors added also. Mass equation of state may be  $E = mc^2 + 1/2mv^2 + 1/2I(\omega)^2 + 1/2kx^2 + kQ_1Q_2/r + Gm_1m_2/r$ .

<sup>1</sup>some contents presented in past APS meetings.

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