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Variable Nuclear Barrier Heights as Irregular Potential Waves Due to Various Nuclear Motions STEWART BREKKE, Northeastern Illinois University — The nuclear potential barrier height is an irregular wave due to random and periodic motion nuclear motions such as vibration, rotation and orbiting. Due to the vibrations and other nuclear motions, the potential well is vibrating irreglarly also. Assume the nuclear motion is a three dimensional oscillator were $r = \{(A\cos X)^2 + (A\cos Y^2 + A\cos Z)^2)\}^{1/2}$. For cos =0, r = 0 min, cos =RMScos, r=1.22A average, cos=1, r= 1.707A max. Therefore, using V = kq(1)q(2)/r the barrier height ranges from V=infinitely high, = 0.816q(1)q(2)/A on average, to a low of 0.577q(1)q(2)/A where A= average amplitude of nuclear vibration, q(1) is the nuclear charge, q(2) = charge of incoming or outgoing particle. Nuclear motion makes the gravitational and magnetic fields irregular wave also.

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