

60. Since the energy is proportional to the amplitude squared (see Eq. 16-21), we find the fractional change (assumed small) is

$$\frac{E' - E}{E} \approx \frac{dE}{E} = \frac{dx_m^2}{x_m^2} = \frac{2x_m dx_m}{x_m^2} = 2 \frac{dx_m}{x_m} .$$

Thus, if we approximate the fractional change in x_m as dx_m/x_m , then the above calculation shows that multiplying this by 2 should give the fractional energy change. Therefore, if x_m decreases by 3%, then E must decrease by 6%.