(a) Plot a graph of the Geiger counter counts vs voltage. You can download the data from the computer into an excel spreadsheet format.

(b) Plot a graph of ln(cnts) vs. time for you half-life measurements. Fit this to a straight line and plot the fit on top of the data.

(c) Make sure to properly label and document all your graphs.

(d) Calculate half-life and its uncertainty from your data.

(e) Plot the counts vs. attenuator thickness for you range-energy data.

(f) Estimate the maximum beta particle energy, and your uncertainty in this value.

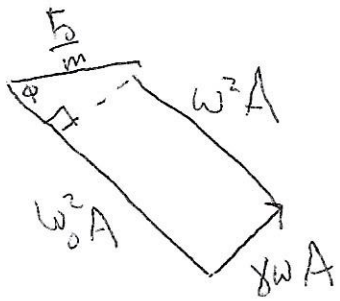
4. Conclusions

(a) Compare you half-life value to the expected value and comment on how well you were able to measure this quantity.

(b) Compare you estimated beta-particle energy with the expected energy of the beta. To find the expected energy, you need to look up the decay of the particular beta- source you used in the CRC nuclear data table.

(c) Suggest ways in which the experiment might be improved.

$$\frac{F_0}{m}\cos\omega t = \ddot{\psi} + \gamma\dot{\psi} + \omega_0\psi$$



$$\psi = A\cos(\omega t + \phi)$$

$$\dot{\psi} = \omega A\cos(\omega t + \phi + \tfrac{\pi}{2})$$

$$\ddot{\psi} = \omega^2 A\cos(\omega t + \phi + \pi)$$

$$(\omega_0^2 - \omega^2)^2 A^2 + \omega^2\gamma^2 A^2 = \left(\frac{F_0}{m}\right)^2$$

$$\cos\phi = \frac{(\omega_0^2 - \omega^2)A}{\frac{F_0}{m}}$$