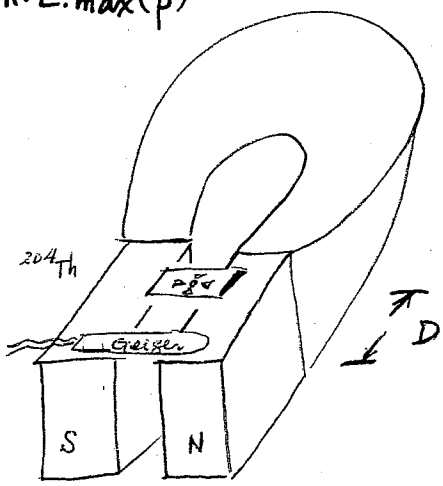
$^{204}_{81}Tl$ 3.6 year

β^- $Q = 0.765\ MeV = K.E._{max}(\beta)$

Pb

Use the compass to check poles. check polarity so that electron curves in the magnetic region and comes back to the Geiger tube.



$D = 2R,\ R = \frac{p}{eB}$

$B \simeq 0.1\ T$

TAPE THE GEIGER TUBE

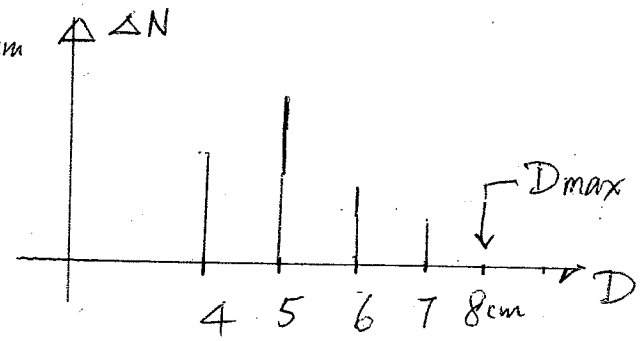
$E_{max}(e^-) = (0.765\ MeV + 0.511\ MeV)$
$= 1.276\ MeV$

$p_{max}(e^-) = \sqrt{E_{max}^2 - m_e^2 c^4}/c = \sqrt{1.276^2 - 0.511^2}\ MeV/c = 1.17\ MeV/c$

$\frac{mv^2}{R} = eBv$; $p = eBR$; $R_{max} = \frac{p}{eB} = \frac{1.17 \times 10^6\ eV/c}{e\ (0.1\ T)} = \frac{11.7 \times 10^6}{3 \times 10^8}\ m$

$D_{max} = 3.89\ cm \times 2$ $= 3.89 \times 10^{-2}\ m = 3.89\ cm$

Experiment, we find D_{max} from the histogram



Then, reverse the above calculation and find $K.E._{max}(e)$

$Q - K.E._{max}(e) \geq m_\nu c^2$ and

hence we find the upper limit of neutrino mass

If there is not neutrino, all energy will be given to the electron, all events will be locate at D_{max}, but that is not the case!