

Measurement of β –ray spectra

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Abstract

Using a thin lens magnetic spectrometer, we measure the momentum spectrum of electrons emitted as β^- particles from a radioactive source of ^{137}Cs . The momentum of the radiated electrons is defined by the spectrometer's adjustable magnetic lens current and k a proportionality constant dependent on the geometry of the apparatus. The lens current modulates the magnetic field which has the effect of modifying the trajectories of the electrons, focusing electrons with specific momenta onto the detector allowing us to measure their intensity. By converting the measured momentum to energy we are able to fit our data to a linear model based on the Fermi-Kurie plot. We find the value of the kinetic energy of the observed nuclear transition is $T = 0.530 \pm 0.018$ MeV.