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Energy Spectra Reconstruction from Beta Emitters: A Study of the 90SR/90Y Case ARIANO MUNDEN, PAUL GUEYE, CYNTHIA KEPPEL, CHRIS SOARES — Reconstruction of individual electron energies from a 25μCi ^{90}Sr/^{90}Y radioactive source was performed using a dipole magnet and a scintillating fiber based detector. The dipole was constructed from two 5.08x5.08x2.54cm permanent magnets separated by a distance of 2 cm and having a maximum field of about 5kG. The electron beam leaving the source has a 2.28MeV maximum energy and was collimated within a 1cm at the entrance face of the magnet. Mapping of the magnetic field was done using a hall probe with an accuracy of about 2G. An electron detector consisted of blue shifted scintillating fibers with thicknesses of 1mm was used to detect the particles exiting the magnet. The data was compared with the ICRU energy distribution data for 90Sr, 90Y, and the composite 90Sr/90Y sources. The comparison was performed using a chi squared test. The setup provides an energy resolution less than 10%. Such system could be used to reconstruct the energy distribution of any beta emitter for various types of calibrations as used in experimental physics (nuclear/high energy, medical, material sciences etc.). .

Ariano Munden

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