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Coincidence System for Radionuclide Standardization Using Surface Barrier Detectors

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A system for the standardization of alpha-gamma or electron-X radionuclide emitters has been developed at the Instituto de Pesquisas Energéticas e Nucleares in São Paulo, Brazil. The system consists of one or two surface barrier detectors for alpha or electron detection which are coupled to thin-window NaI (Tl) crystals suitable for low energy X or gamma ray detection. The performance of the system has been verified by means of ^{241}Am and ^{137}Cs solutions. The absolute activity has been obtained using the extrapolation method applied to the $4\pi\alpha$-γ or $4\pi e_c$ - X coincidence technique. The surface barrier detection efficience was varied by placing absorbers over the radioactive sources or by changing the source to detector distance. The results were compared to those obtained using a gas-flow 4π proportional counter. The agreement between the two methods was around 0.5%.