

New Method for Analysing Daily Quality Control: Beta-Gamma Spectra for Checking Energy Calibration

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The radionuclide system gain stability is critical to provide accurate measurements of the activity. There are several different methods for processing daily quality control (QC) beta-gamma two-dimensional (2-D) spectra for checking energy calibration. Fitting to a template seems the most correct method for monitoring the calibration stability. The possibility of using a template for a 2-D spectrum has been investigated. The template is created using locally weighted scatterplot smoothing (LOWESS) of a 2-D LONG QC spectrum (a histogram). It is necessary to smooth out the LONG QC spectrum histogram. Daily fitting of the template to the QC spectrum using the weighted least squares method gives the "tweaking" factors of the gain shift. A number of calculations have been carried out based on the results of measurements of the MIKS QC source (Cs-137 and Ba-133). Different approaches have been compared. The template-fitting method provides the most stable results even with poor statistics.

Promotional text

The stability of the radionuclide system gain is critical to ensure accurate activity measurements. This study aims to improve quality control spectra processing methods.

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