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T3.1-P05. Determination of full energy peak efficiency of HPGe for volume source by Monte Carlo

The HPGe detector represents one of the fundamental instruments in noble gas measurements. Operating these systems requires an accurate knowledge of detection efficiency, which varies strongly with the source–detector distance. This means that we need a recalibration of detector efficiency for each sample–detector configuration. Big volume sources like Marinelli geometries can provide the best detection limits. But the establishment of the efficiency calibration curve is particularly complex because the calibration procedure needs standard volume sources which are not always accessible and it's production has some difficulties. Alternative of volume sources is some standard point sources with several different energies. Also, development of Monte Carlo based calculated codes ,such as MCNPX , give us the possibility of accurate simulation of these detection systems. In this work, the accurate configuration of HPGe is simulated by MCNPX code and the simulated model is verified by several experiments with point sources. After being sure that the model is correct, the efficiency curve of a volume source is determined by MCNPX and then is verified by experiments using some standard point sources. The point source-detector position is in such a way that the point sources act as an equivalent volume source.

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