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Radiometric Characterisation Of Bricks For Use In A Planned Calibration Facility For In-Situ Gamma-Ray Detectors

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Abstract content
   (Max 300 words)

In-situ gamma-ray measurement systems commonly use scintillator detectors to measure radioactivity content (natural and anthropogenic). One common geometry used in these measurements is that of detector mounted on a vehicle moving across flat ground. In order to obtain absolute radioactivity concentrations in the ground from such measurements it is necessary to know the detector response in terms of gamma-ray detection efficiency.

Efficiency calibration of in-situ detectors can be performed in various ways. One approach is to use calibration pads that have well characterized radioactivity content. An alternative approach is to make measurements with the detector inserted inside a brick "castle" with the proviso that brick radioactivity (natural) content is accurately determined. The brick "castle" is best optimized by making use of Monte Carlo simulations. With the simulation one can optimize the dimensions of the brick "castle", the type of material to be used and the geometry. We present here results from our radiometric analyses using high-resolution gamma-ray spectrometry of candidate brick types. We discuss these results and other brick selection criteria to propose a brick "castle" design for construction at iThemba LABS.

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yes

Level for award
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MSc

Main supervisor (name and email)
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Dr. N.M. Jacobs

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No

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