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Investigation of a dynamic measurement methodology for fast detection of gross defects in regularly distributed nuclear material samples

Fast detection of gross defects in regularly distributed Nuclear Material could be achieved via employing dynamic measurements. In some cases, the use of non-destructive static measurements (at which the measuring device and the measured sample are located in fixed positions) may not provide sufficient information about a measured item. This may occur due to self-attenuation and/or screening effects. Consequently, it might be required that the material is being moved or rotated in order to obtain more accurate results. Meanwhile, the measuring device should react, in some way or another, to the timely acquired information.
While using scanning gamma ray measurement techniques, the response of a measuring system to radiation emitted from regularly distributed rotating NM results in a spectrum of a specific pattern. This pattern could represent a signature for a NM sample measured with a specific setup configuration and specific dynamic parameters. Any deviation of this signature may indicate some defect in the measured material.
In this work a Non-Destructive Dynamic (NDD) method is investigated to detect gross defects in regularly distributed NM (fuel assembly of EK-10 type). Different scenarios were considered and studied using Monte Carlo calculation method with using the MCNP5 Code. The results showed that the investigated method could be easily applied to detect gross defects.

Which ”Key Question” does your Abstract address?

NEW1.2

Topics

NEW1

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