

Author's Accepted Manuscript

Layered shielding design for an active neutron interrogation system

Zachary D. Whetstone, Kimberlee J. Kearfott



PII: S0969-806X(16)30094-9
DOI: <http://dx.doi.org/10.1016/j.radphyschem.2016.03.018>
Reference: RPC7108

To appear in: *Radiation Physics and Chemistry*

Received date: 30 October 2015
Revised date: 21 March 2016
Accepted date: 22 March 2016

Cite this article as: Zachary D. Whetstone and Kimberlee J. Kearfott, Layered shielding design for an active neutron interrogation system, *Radiation Physics and Chemistry*, <http://dx.doi.org/10.1016/j.radphyschem.2016.03.018>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Layered shielding design for an active neutron interrogation system

Zachary D. Whetstone, Kimberlee J. Kearfott (corresponding author: kearfott@umich.edu)

Department of Nuclear Engineering and Radiological Sciences, University of Michigan, 2355

Bonisteel Boulevard, 1943 Cooley Building, 48109-2104 Ann Arbor, MI USA

Abstract

The use of source and detector shields in active neutron interrogation can improve detector signal. In simulations, a shielded detector with a source rotated $\pi/3$ radians relative to the opening decreased neutron flux roughly three orders of magnitude. Several realistic source and detector shield configurations were simulated. A layered design reduced neutron and secondary photon flux in the detector by approximately one order of magnitude for a deuterium-tritium source. The shield arrangement can be adapted for a portable, modular design.

Keywords

Active neutron interrogation; radiation shielding; neutron detection; gamma ray detection; portable shielding; shielding simulations

Download English Version:

<https://daneshyari.com/en/article/1885851>

Download Persian Version:

<https://daneshyari.com/article/1885851>

[Daneshyari.com](https://daneshyari.com)