

Abstract
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Title: Characterization of Low Intensity Pulsed Neutron Fields Using a Passive Neutron Spectrometer Employing TLD 600/700 pairs.

Abstract:

In certain work environments, the determination of neutron fluence and spectral information associated with infrequent low intensity, sub-milli-second pulsed fields is needed to provide accurate external dosimetry results. Scintillation detectors such as lithium iodide or NE213 cannot respond fast enough to provide meaningful information. Activation foils, such as gold, dysprosium or indium lack the required sensitivity. A different approach using integrating detectors (TLD 600/700 pairs) arranged in a geometric pattern along an XYZ axis within a single high-density polyethylene sphere was modeled using MCNP6. Modeling results indicate an energy dependent response as a function of depth. The response functions can be used to unfold the detector readings yielding both fluence and spectral information in an equivalent manner as used for Bonner Spheres. This technique can be applied to both pulsed and steady-state fields.

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