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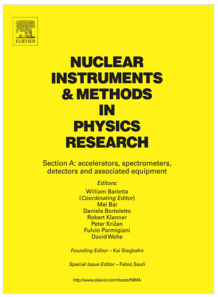

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Fast neutron transmission imaging of the interior of large-scale concrete structures using a newly developed pixel-type detector

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Abstract

Given the increased demand for nondestructive inspections of the insides of bulk concrete structures, in this paper, we propose a new transmission imaging system that uses fast neutrons via an accelerator-driven compact neutron source. A key component that we have developed is a pixel-type fast neutron detector that consists of a 4×4 array of plastic scintillators with semiconductor photon sensors. Using neutron transmission images obtained with this detector, we have successfully identified a steel bar, a void hole, and water with 300-mm-thick concrete blocks via a RIKEN Accelerator-driven compact Neutron Source (RANS).

Keywords: fast neutron imaging, fast neutron detector, compact neutron source, nondestructive inspection

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