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Composite scintillators - new type of radiation hard scintillator

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Composite scintillators are new promising detectors for use in severe radiation environments. They consist of crystal granules embedded into an optical transparent medium. This ensures a high radiation hardness within the scintillator with comparison to normal plastic scintillators. However, composite scintillators are low opacity materials as a result of the light scattered by the small crystal granules.

We report on optical and structural properties of these composite scintillators after irradiation using a neutron beam of above 1×10^{14} n/cm² generated by the IBR-2 reactor at the Frank Laboratory of Neutron Physics in Dubna, Russia. The irradiation effects were characterized using Raman spectroscopy, Light yield and Light Transmission measurements. We further report on the advantages and disadvantages of these composite scintillators; and problems that need to be addressed. Preliminary results indicate a change in the light yield and light transmission after a certain neutron flux whilst no structural changes were observed from the Raman spectroscopy results.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD, N/A)?

MSc

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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