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## A comparative study of the high fluence neutron radiation effects on the structural and optical properties of plastic scintillator UPS 923A

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We report on the optical and structural properties of plastic scintillators irradiated with a neutron beam produced by the IBR-2 reactor of the Frank Laboratory of Neutron Physics in JINR, Dubna. Blue and green shifting Ukraine polystyrene-based scintillators UPS 923A were irradiated with neutron fluence ranging from  $3 \times 10^{13}$  to  $1.7 \times 10^{16}$  n/cm<sup>2</sup> and neutron energy  $E > 1$  MeV. Discolouring in the plastic scintillators was observed after irradiation. The effects of radiation damage on the optical and structural properties of the samples were characterized by conducting light yield, light transmission, light fluorescence and Raman spectroscopy studies. According to the results obtained, neutron radiation does influence damage in the material. The disappearance of the Raman peak features in green emitters at 1165.8, 1574.7 and 1651.2 cm<sup>-1</sup> revealed significant structural alteration due to neutron bombardment. We observed a loss in the fluorescence intensity, light yield and light transmission in the plastics.

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Dr Chamunorwa Oscar Kureba  
Department of Physics and Astronomy, Botswana International University of Science and Technology, Private Bag 16, Palapye, Botswana  
kurebac@biust.ac.bw

**Primary authors:** Prof. MELLADO, Bruce (University of the Witwatersrand); Dr KUREBA, Chamunorwa Oscar (Botswana International University of Science and Technology); Prof. SIDERAS-HADDAD, ELIAS (University of the Witwatersrand); Mr MOKGATITSWANE, Gaogalalwe (Botswana International University of Science and Technology); Ms MDHLULI, Joyful Elma (University of the Witwatersrand); Dr ERASMUS, Rudolph (University

of the Witwatersrand); Mr BARANOV, Vladimir (Joint Institute for Nuclear Research, Dubna, Russia); DAVYDOV, Yuri (Joint Institute for Nuclear Research, Dubna, Russia)

**Presenter:** Mr MOKGATITSWANE, Gaogalalwe (Botswana International University of Science and Technology)

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