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Measurement of refractive index of phenyl-based scintillators before and after irradiation

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Plastic scintillators are common materials in sampling calorimeters. At proton-proton colliders such as the LHC, the intense radiation environment can alter their optical properties, including the index of refraction. We present measurements of the change in the index of refraction for doses between 12 and 70 kGy and show that the size of the change depends on the presence of oxygen. We do this using a new, simple method to measure refractive index based on a consumer-grade camera. The proposed method has a precision within 0.10-0.15%, making it comparable to and more cost-effective than other methods.

Mini Symposia (Invited Talks Only)

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