

Quality control of plastic scintillators for the total-body J-PET scanner

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Total-body Jagiellonian positron emission tomography (TB-J-PET) is based on long plastic scintillators [1] which decrease cost of the scanner [2]. TB PET scanners enable positronium imaging [3], measurements of polarization of photons [4] and beam therapy monitoring [5]. Development of TB-J-PET requires application of transparent plastic scintillators with low light attenuation [6] to build modules with SiPMs attached at both ends of the scintillators. For modular TB-J-PET construction we choose BC-408, one of the most transparent plastic scintillator from our previous measurements [7]. Purpose of this research is to verify quality of received scintillators. Transmittance at the wavelength of maximum emission through 6 mm thick scintillator and technical attenuation length along 330 mm long scintillator were measured on linear CCD array spectrometer for random selected scintillators from each delivered batch. Additionally, scintillators optical homogeneity was measured on light transfer setup consisting of exciting LED and photodiode matrix.

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Field

Detectors and electronics

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