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Scintillation light detection with MAPD-3NK and MPPC-S12572-010P readout

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We have investigated linearity and energy resolution of two different solid state photomultipliers (SiMPs) when reading out the LFS-8 scintillator. Fist SiMP (MAPD-3NK) from Zecotek Photonics consists of deeply burned cells and have an active area of 3.7x3.7 mm2. The second one (MPPC-S12572-010P) from Hamamatsu, however, has surface cell structure and an active area of 3x3 mm2. Both SiMPs have the same pixel density of 10000 mm-2. The size of the LFS-8 scintillator is 2x2x10mm3. Energy resolution and linearity of the SiMPs is studied in the energy range of 59.6-1275 keV. It is found that the MAPD-3NK and the MPPC-S12572-010P readout demonstrates a good linearity of signal detection as a function of the gamma ray energy in the studied energy range. The obtained results show a good energy resolution for the MAPD comparing to the MPPC. The measured gamma resolution at 662 keV is 13% and 20.5% for the LFS-8 scintillator coupled to the MAPD and the MPPC, respectively.

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