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ENC measurement for ASIC preamp board as a detector module for PET system / N. Nagara

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Abstrak

We developed a gamma ray detector with an LuAG:Pr scintillator and an avalanche photodiode as a detector for a positron emission tomography (PET) system. Studies have been performed on the influences of gamma irradiation on application-specific integrated circuit (ASIC) preamp boards used as a detector module. As a device used in nuclear environments for substantial durations, the ASIC has to have a lifetime long enough to ensure that there will be a negligible failure rate during this period. These front-end systems must meet the requirements for standard positron emission tomography (PET) systems. Therefore, an equivalent noise charge (ENC) experiment is needed to measure the front-end system's characteristics. This study showed that minimum ENC conditions can be achieved if a shorter shaping time could be applied.