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Toward sub-100 ps ToF-PET systems employing the FastIC ASIC with analog SiPMs

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Pushing the limits of the readout system in standard ToF-PET scanners will improve tomographic image reconstruction quality. Scintillation crystals optically coupled to photo-detectors, together with fast readout electronics, are the key elements to improve Coincidence Time Resolution (CTR). The 8-channel FastIC ASIC is capable of processing fast signals with a precise time stamp and a linear energy measurement with ≈ 12 mW power consumption per channel.

This work provides a complete analysis of the performance of the FastIC ASIC coupled to different scintillators and photo-detectors from different manufacturers, giving special attention to FBK sensors.

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