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【335】Development of Fast Timing Silicon Monolithic Pixel Sensors and Image Reconstruction for Positron Emission Tomography

Thursday 30 August 2018 18:00 (15 minutes)

The Thin-TOF PET (TT-PET) project aims at the construction of a small-animal PET scanner based on silicon monolithic pixel sensors in SiGe BiCMOS technology with 30 ps time-of-flight resolution. The scanner will also measure the photon depth of interaction with 200 μm precision. This performance will lead to a significant improvement in the image resolution and signal-to-noise ratio with respect to the existing PET scanners. In order to exploit the performance of the scanner, a new reconstruction method based on a maximum likelihood expectation maximization algorithm will be presented.
The first prototype of the monolithic ASIC was tested with a minimum-ionizing beam at CERN. Efficiencies larger than 99% were measured, together with an unprecedented time resolution of approximately 200 ps.

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