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The 100µPET project: Simulation of the next generation PET scanner with monolithic silicon pixel sensors

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The 100µPET project, led by the University of Geneva, the University of Luzern, and the École Polytechnique Fédérale de Lausanne, aims at the development of a small-animal positron emission tomography (PET) scanner with ultra-high-resolution molecular imaging capabilities.

This is achieved with compact and modular stacks of multiple thin monolithic pixel detectors bonded to flexible printed circuits (FPC) via flip-chip, thus resulting in unprecedented scanner depth-of-interaction and volumetric granularity.

Monte Carlo simulations performed with the Allpix2 framework allowed both the optimisation of the scanner design and the generation of realistic scanner data for imaging reconstruction. Very large datasets with billions of events were produced with different source phantoms to characterize its performance.
The scanner is predicted to have a point-spread-function of 0.2 mm, no parallax effect, and display a volumetric spatial resolution of ˜0.015 mm^3 - one order of magnitude better than modern scanners.

The work developed within the Allpix^2 framework, including all simulation results, will be presented in this contribution.

Will the talk be given in person or remotely?

In person

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