



Contribution ID: 12

Type: Talk (invited speaker only) The talk is invitation only

[G01] The 100 μ PET project: a small-animal PET scanner for ultra-high-resolution molecular imaging with monolithic silicon pixel sensors

Thursday 27 October 2022 14:55 (15 minutes)

Recent developments in semiconductor pixel detectors allow for a new generation of positron-emission tomography (PET) scanners that, in combination with advanced image reconstruction algorithms, will allow for a few hundred microns spatial resolutions. Such novel scanners will pioneer ultra-high-resolution molecular imaging, a field that is expected to have an enormous impact in several medical domains, neurology among others. The University of Geneva, the University Hospital of Luzern and the École Polytechnique Fédérale de Lausanne have launched the 100 μ PET project that aims to produce a small-animal PET scanner with ultra-high resolution. This prototype, which will use a stack of 60 monolithic silicon pixel sensors as a detection medium, will provide volumetric spatial resolution one order of magnitude better than today's best operating PET scanners. The R&D on the optimisation of the monolithic pixel ASIC, the readout system and the mechanics, as well as the simulation of the scanner performance, will be presented.

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Session Classification: Future Experiments