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100uPet project

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Positron Emission Tomography (PET) is a powerful imaging technique used in various fields, including medical research and diagnosis. One of the key aspects of PET is achieving ultra-high resolution, which greatly enhances the accuracy and precision of molecular imaging. The 100 μ PET project, born by the synergy between the University of Geneva, the University of Luzern, and the École Polytechnique Fédérale de Lausanne, is a novel approach that aims to advance the development of a small-animal PET scanner with ultra-high-resolution molecular imaging capabilities. This is accomplished by employing a compact, modular stack composed of 60 layers of monolithic pixel detectors and flexible printed circuits (FPC) arranged in 4 towers that will surround the tissue to analyze, resulting in unprecedented scanner depth-of-interaction and volumetric granularity.

This design is particularly challenging concerning developing the module-flex hosting the monolithic sensors. Experimental investigations were conducted to evaluate the electrical performance and reliability of different flip-chip bonding between monolithic sensors and FPC using Non Conductive Paste (NCP), together with the use of dummy chip designed to emulate the interface of the actual sensor, which is currently being designed. This poster presents an overview of the project with a focus on the flip-chip feasibility studies.

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