



Contribution ID: 53

Type: **not specified**

Omni-purpose detectors based on stacks of CMOS active pixel sensors

The trend in subatomic physics experiments is to increase the granularity of measurements, in space and time. Practical difficulties limit the achievable performances, since current experiments mostly rely on the integration of heterogeneous technologies. In contrast, a continuous pixelated sensitive volume could replace a complete complex setup and provide unprecedented performances, if the material can detect various particle types. CMOS monolithic active pixel sensors (CMOSMAPS) benefit nowadays from a high sensitivity and a thickness almost entirely sensitive. A stack of CMOS-MAPS in direct contact would act as the volume dreamed for, providing tracking, calorimetric and timing information. The number of layers in the stack, their thickness and the specifications of their pixel sensors would be adapted to optimise the overall performances depending on the type of particles (charged particles, ions, X-rays, gamma-rays), their energy and flux. The potential applications of this new type of instruments span a vast range of domains, from scientific to industrial measurements. The plasticity of the stack configuration and versatility offered by CMOS-MAPS will grant cross-fertilisation between these fields. The realisation of such stacks of CMOS-MAPS will combine and optimise processes from the semi-conductor industry to solve the main issues, among which are interconnections, mechanical stability, power dissipations and data throughput.

Author: BAUDOT, Jerome (Institut Pluridisciplinaire Hubert Curien (FR))

Co-author: BESSON, Auguste Guillaume (Institut Pluridisciplinaire Hubert Curien (FR))

Presenter: BAUDOT, Jerome (Institut Pluridisciplinaire Hubert Curien (FR))