

## From Vertex detectors to Inner Trackers with CMOS pixel sensors

*Thursday, February 18, 2016 2:00 PM (20 minutes)*

The use of CMOS Pixel Sensors (CPS) for high resolution, low material, vertex detectors has been validated with the 2014 and 2015 physics runs of the STAR-PXL detector at RHIC/BNL. This opens the door to the use of CPS for inner tracking devices, with 10-100 times larger sensitive area, which require therefore a sensor design privileging power saving, response uniformity and robustness. Exploiting the relaxed constraints on the spatial resolution of trackers and the added value of a 180 nm CMOS process, a specific small CPS prototype was fabricated in 2014, with 5 times larger pixels than those used in STAR. Its detection performances were assessed with particle beams, investigating in particular the impact of the reduced sensing node density on the detection efficiency. The studies were complemented by those of a full scale prototype (160k pixels) featuring small pixels for a vertex detector, in which large pixels could be implemented as a next step. The most prominent outcomes of this R&D, which validates for the first time the concept addressed, will be presented.

**Primary author:** PEREZ PEREZ, Luis Alejandro (IPHC - CNRS)

**Presenter:** PEREZ PEREZ, Luis Alejandro (IPHC - CNRS)

**Session Classification:** Semiconductor Detectors

**Track Classification:** Semiconductor Detectors