



## **SÉMINAIRE DE PHYSIQUE CORPUSCULAIRE**

**SUJET :** Radiation-hard Active Silicon Sensors for the ATLAS Upgrade

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### **RÉSUMÉ:**

In the coming years, the LHC will be upgraded to provide much higher luminosity. This implies increased radiation damage, occupancy and pile-up for ATLAS and requires the replacement of the current Inner Detector with an improved all-silicon Tracker. While the standard silicon sensor technology appears to be capable of fulfilling the demanding HL-LHC requirements, new innovative technologies might offer significant advantages.

Deep-submicron HV CMOS processes feature moderate bulk resistivity and HV capability and are therefore good candidates for drift-based radiation-hard monolithic active pixel sensors (MAPS). For the ATLAS Upgrade, the concept of using a deep-submicron HV CMOS process to produce a drop-in replacement for traditional radiation-hard silicon sensors is explored. Unlike fully integrated MAPS, such active sensors contain simple circuits, e.g. amplifiers and discriminators, but still require a traditional (pixel or strip) readout chip. This approach yields most of the advantages of MAPS (improved resolution, reduced cost and material budget, etc.), without the complication of full integration on a single chip.

After outlining the design of the HV2FEI4 test ASIC, characterization results and first experience obtained with pixel and strip readout will be shown before discussing future prospects of active sensors and CMOS-based detectors in general.

INFORMATION : <http://dpnc.unige.ch/seminaire/annonce.html>

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