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## **LePix – a high resistivity, fully depleted monolithic pixel detector**

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The LePix project explores monolithic pixel sensors fabricated in a 90nm CMOS technology for which more lightly doped substrates are available. This maintains the advantages usually offered by Monolithic Active Pixel Sensors (MAPS), like a low input capacitance, having a single piece detector and using a standard CMOS production line, but offers charge collection by drift from a depleted region several tens of microns deep into the substrate, and therefore an excellent signal to noise ratio and a radiation tolerance superior to conventional un-depleted MAPS. Such sensors are expected to offer significant cost savings and reduction of power consumption for the same performance, leading to the use of much less material in the detector (less cooling and less copper), addressing one of the main limitations of present day particle tracking systems.

A review on the technology and the most important experimental results achieved so far will be presented. The focus will be on the latest evolution of the project, which uses detectors thinned down to 50 um to obtain back illuminated sensors operated in full depletion mode. By back-processing the chip and collecting the charge from the full substrate it is hence possible to efficiently detect soft X-rays up to 10 keV. Test beam results from synchrotron light tests as well as potential application of this monolithic device will be discussed.

### **quote your primary experiment**

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