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Latest results on timing performance of silicon pixel detectors

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Monolithic active pixel sensors (MAPS) have recently been used as building blocks of charged particles tracking and vertexing detectors because they offer lower material budget, higher granularity as well as a simpler assembly procedure and lower cost compared to the traditional wide spread hybrid technology.

The interest towards monolithic silicon sensors offering both excellent timing and position resolution has increased and different approches are being explored. Traditionally large collection electrodes have been used for precision timing to approach a planar structure with large, uniform fields. However, significant improvement of time resolution and speed of charge collection has recently been demonstrated on MAPS built on 180nm TowerJazz CMOS imaging technology and is currently being further explored on 65nm TowerJazz Panasonic Semiconductor (TPSCo) technology. In parallel, structures with amplification layers like SPADS and LGAD are being studied both in CMOS and BiCMOS technologies.

In this presentation I will report on the latest results obtained in the 65 nm CMOS technology and also give an overview of the other developments.

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