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First results on monolithic pixel sensors test structures in the 65 nm technology

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The ALICE ITS3 (Inner Tracking System 3) upgrade project together with the CERN EP R&D on monolithic sensors are exploring the Tower Partner Semiconductor Co. (TPSCo) 65 nm ISC process.
The ITS3 project aims to build the first fully cylindrical tracker by using wafer scale, ultra thin (20 - 40 µm) bent MAPS.
Four different pixel test structures, Circuit Exploratoire 65 (CE65), Digital Pixel Test Structure (DPTS), Analogue Pixel Test Structure - Source Follower (APTS-SF), Analogue Pixel Test Structure - Operational Amplifier (APTS-OPAMP), were designed to validate the sensor technology through an extensive characterization both with laboratory and in-beam measurements.
A particular focus will be given to the APTS-OPAMP which is equipped with a fast in-pixel OPAMP-based buffering to explore the sensor timing performance.
This work will show the sensor design, an overview on the different pixel test structures, and results obtained with a Fe-55 source and at test beam facilities.

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