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## Experimental results for the Cherwell 1 and 2 MAPS sensors

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We report on the status and performance of the CMOS Monolithic Active Pixel Sensor (MAPS) Cherwell 1 and 2 sensors for the detection of charged particles in vertexing, tracking, and calorimetry applications. Cherwell is a 4-T CMOS sensor in 180 nm technology on a 12um epitaxial substrate with low-noise, low-power, in-pixel correlated double sampling, and high conversion gain.

Cherwell 1 consists of four arrays, two optimized for vertexing and tracking applications, and two for digital calorimetry applications. The vertexing arrangements have a matrix of 96x48 pixels with a pitch of 25 um. The “reference array” is readout on a rolling shutter base with a fine resolution 12-bit, single-slope column parallel ADC. The “strixel” array has the readout and ADC circuits embedded in the space between the pixel diodes. The two sections for calorimetry have a matrix of 96x48 pixels with 25 um pitch and 48x24 pixels with 50 um pitch, respectively. Additional circuitry is added to provide charge summing of 2x2 pixels during readout.

Cherwell 2 is a prototype candidate sensor to be used in the upgrade of the ALICE Inner Tracker System at the LHC. It has three variants of a 128x128 pixel array on a 20um pitch using the strixel technology.

We report on the characterisation and performance of the prototypes, on the test bench and at the test beam.

### Summary

Performance of two prototype CMOS MAPS sensors.

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