

Design and fabrication of Endcap prototype sensors (petalet) for the ATLAS Upgrade

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A prototype for the Endcap part in the ATLAS Upgrade has been designed and fabricated at CNM-Barcelona. The petalet, prototype for the full petal, includes microstrips with built-in stereo angle. Because of their particular geometry, a Python script was developed to design the sensors and propose solutions for different issues such as, orphan strips, no-standard bias rails and also to add some features like embedded pitch adaptors. The sensors are being fabricated and some initial results on the sensor performance will be presented.

Summary

The design and construction of a petal stave, which will be used for the Endcap in the ATLAS Tracker Upgrade, is a difficult task due to many different shapes and objects resulting from the built-in stereo angle in each sensor and the petal shape. Strips on each sensor are laid-out with 20 mrad stereo angle so that front and back sensors produce 40 mrad, this is done in order not to rotate sensors on both sides.

The petalet prototype is composed by 3 trapezium-shaped sensors, each sensor contains 2 strip rows. Four inches silicon wafers were used for fabrication which was performed in the clean room facilities at CNM-Barcelona. The assembly of the sensors into the petalet modules will be done by other institutes of the ATLAS collaboration (Valencia, DESY, Freiburg).

Authors: LACASTA LLACER, Carlos (IFIC-Valencia); Prof. GARCIA, Carmen (Universidad de Valencia (ES)); Dr FLETA CORRAL, Celeste (Universidad de Valencia (ES)); PELLEGRINI, Giulio (Universidad de Valencia (ES)); LOZANO FANTOBA, Manuel (Universidad de Valencia (ES)); Dr ULLAN COMES, Miguel (Universidad de Valencia (ES)); BENITEZ CASMA, Victor Hugo (Universidad de Valencia (ES))

Presenter: BENITEZ CASMA, Victor Hugo (Universidad de Valencia (ES))

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