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LF2 Characterization

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The LF2 is a depleted MAPS prototype chip produced in 2018 in the LFoundry 150 nm HV-CMOS process by the collaboration of IFAE, University of Liverpool, University of Geneva and KIT with the support of RD50. The chip includes two monolithic matrices which are completely independent and only share the substrate: a tracking pixel detector and a photon counting device.

The main components of the analog readout electronics, very similar in both matrices, are a sensor bias circuit based on a high ohmic resistor, a charge sensitive amplifier, a source follower, filter and a CMOS comparator with a local 4-bit DAC to compensate for offset variations. Each pixel also includes an injection circuit to test the readout electronics. With respect to the digital readout electronics, the photon counting array contains a 16-bit counter while in the tracking matrix the circuits follow an FE-I3 readout approach. The analog and digital readout electronics are embedded inside the pixel sensitive area in both matrices.

The LF2 ASICs were received in 2018 and a readout system, based on the Xilinx ZC706 FPGA board, was developed. The initial results of the table-top characterization of the devices will be presented.

Author: FORSTER, Fabian Alexander (IFAE Barcelona (ES))

Co-authors: GRINSTEIN, Sebastian (IFAE - Barcelona (ES)); TERZO, Stefano (IFAE Barcelona (ES)); PUIG-DENGOLES, Carles; VILELLA FIGUERAS, Eva (University of Liverpool (GB)); CASANOVA MOHR, Raimon (The Barcelona Institute of Science and Technology (BIST) (ES))

Presenter: FORSTER, Fabian Alexander (IFAE Barcelona (ES))

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