

A monolithic ASIC for the very high precision pre-shower detector of the FASER experiment at the LHC

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The design of a monolithic silicon pixel detector for the preshower of the FASER experiment at LHC is in progress, with the purpose of measuring and discriminating electromagnetic showers generated by photons with O(TeV) energies and separation down to 200 μm .

The new detector requires the development of a monolithic silicon pixel sensor with hexagonal pixels of 65 μm side, an extended dynamic range for the charge measurement and the capability to store the charge information for thousands of pixels per event. The ASIC will integrate a fast front-end electronics and analog memories inside the pixel area to allow for a frame-based event readout with minimum dead area and O(100) ps time resolution. A description of the architecture and design solution of the monolithic ASIC will be presented.

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