Contribution ID: **71** Type: **Poster**

MuPix8 - a large-area D-MAPS chip

Monday 11 September 2017 16:40 (15 minutes)

The architecture of the first large area $2 \times 1cm^2$ MuPix8 prototype, produced in an AMS $180nm$ HV-CMOS process, is presented.
The MuPix8 chip is a High Voltage Monolithic Active Pixel Sensor (HV-MAPS) being developed for the Mu3e experiment which will search for the lepton flavour violating decay $\mu^+ \rightarrow e^+e^-e^+$ with an unprecedented sensitivity of one in 10^{16} decays. To reach this sensitivity goal an ultralight-pixel tracker with 10^{-3} radiation lengths per tracking layer and high rate capability is being built. The Mu3e pixel tracker will be based on MuPix chips with a thickness of $50\mu m$ and a pixel size of $80 \times 80\mu m^2$. The hits are readout by on-chip state machines and the data are streamed out via four 1.25 Gbit/s data links.
The Mupix8 is the first prototype which fulfills above requirements and features the full column length of the final chip. In addition, it implements circuitry providing pulse height information, thus allowing for timewalk suppression aiming at time resolution of $10ns$ or better.

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Session Classification: Poster Exposition and coffee break