



Contribution ID: 137

Type: Oral presentation using Zoom

Towards a Pixel TPC

Thursday, 28 October 2021 19:40 (20 minutes)

We have developed a gaseous pixel detector based on four Timepix3 chips that can serve as a building block for a large detector plane. To provide the required gas amplification a fine grid has been deposited on the chip surface by wafer post-processing (GridPix technology). The precisely aligned grid holes and chip pixels having a pitch of 55 μm and the high time resolution of 1.56 ns of the Timepix3 chip enable the reconstruction of each individual ionization electron where the accuracy is dominated by diffusion. The QUAD was designed to have minimum electrical field inhomogeneities and distortions, achieving a tracking precision in the pixel plane with systematics of better than 10 microns. Due to the high efficiency to detect the ionization electrons a precise measurement of the energy loss dE/dx can be performed. The QUAD detector has all services located under the detection surface. In this way multiple QUADs can be simply put together to create a detection surface of arbitrary dimensions. Using the 8 QUADs a module was constructed with a readout system. The module was tested inside the PCMAG magnet in an electron beam at DESY in June 2021 where a silicon telescope was used to provide accurate tracking. In the presentation details about the construction of the QUAD and module will be discussed. The results from the QUAD will be reviewed. An idea to improve the gating for a Gridpix device will be presented. Simulation results for the performance of a full pixel TPC in ILD will be presented. Finally, first preliminary results for the module in the DESY testbeam will be shown.

1st preferred time slot for your oral presentation

19:00-21:00 JST (12:00-14:00 CEST, 6:00-8:00 EDT, 3:00-5:00 PDT)

2nd preferred time slot for your oral presentation

15:30-17:30 JST (8:30-10:30 CEST, 2:30-4:30 EDT, 23:30-1:30 PDT)

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Session Classification: C-3: Tracking detectors

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