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Three-dimensional reconstruction of single-electron clusters in a gaseous detector read out by the TimePix pixel circuit

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In recent years the detection of minimum ionising particles in a gaseous detector by means of a CMOS pixel readout circuit as direct anode, has been demonstrated. Sofar the used pixel circuitry provided only a 2-dimensional projection of the position of the primary ionisation clusters. In the newly developed TimePix chip, based on the earlier used Medipix2 chip, each pixel also has the capability to record the arrival time of the detected single electrons. We present initial 3-dimensional reconstruction results from a small drift chamber, equipped with the TimePix chip as active anode. The readout chip is covered by a Micromegas foil to form a parallel-plate amplification gap.

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