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A new readout scheme of reading out RPC and gaseous detectors

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A new readout scheme allowing the exploitation of Resistive Plate Chamber (RPC) spatial precision and using a limited number of electronic channels is proposed. The new scheme which exploits the spread of the RPC induced charge on several adjacent inter-connected pads, allows the simultaneous detection of several particles without ambiguity.

In this scheme, pads are connected in rows through buried vias in rear layers in an original way so the charge induced by the passage of one particle is shared among pads belonging to different directions. The pads of one row are connected to one electronic channel.

The position of the particle is determined by the intersection of the rows associated to the fired pads and the ambiguity is eliminated by the fact that more than two crossing rows with two different directions are concerned.

The new scheme allows to instrument large detectors with a reduced number of electronics channels without reducing the spatial resolution obtained with pads read out individually.

We will present the results obtained on a cosmic ray bench built with 60 cm x 70 cm RPC read out with the new readout scheme and we will discuss our plan to use the new scheme to instrument large gaseous detectors.

Author: COMBARET, Christophe (Centre National de la Recherche Scientifique (FR))

Co-authors: LAKTINEH, Imad (Centre National de la Recherche Scientifique (FR)); MIRABITO, Laurent (Centre National de la Recherche Scientifique (FR))

Presenter: LAKTINEH, Imad (Centre National de la Recherche Scientifique (FR))

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