



Contribution ID: 113

Type: **not specified**

A NEW PROTOTYPE WITH ALTERNATING WIRES FOR THE CBM-TRD

The CBM (Compressed Baryonic Matter) at FAIR will be dedicated to the exploration of the QCD phase diagram in the region of high net-baryon densities. The CBM Transition-Radiation Detector (TRD) has to deliver a good tracking and electron identification performance at high interaction rates. A thin Multi-Wire Proportional Chamber without drift volume delivers the required high rate capabilities.

One key challenge is to achieve stability of the gas gain. To reduce its sensitivity to cathode deformations, an alternating wire structure, as proposed for the ALICE VHMPID (Nucl. Instrum. Meth. A698 (2013) 11-18), is exploited: Field wires are introduced between the sense wires to improve the field line geometry and its stability.

Lab measurements of the anode current and of the energy resolution were performed with an iron-55 source. The results clearly indicate a superior performance for the new prototype: Gain variations can be reduced from up to 60 % (standard prototype) to below 15 % (new prototype).

Supported by BMBF and the Helmholtz International Centre HICforFAIR.

Invited Talk (yes/no)?

no

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