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Characterization of a low-pressure Micromegas-like gaseous detector with low energy x-ray sources

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Within the family of the Micro Strip Gas Detectors (MSGD), the intrinsic characteristics of the bulk Micro-Megas (MM) device represent the most promising features for the construction of a new instrument to be operated as a TPC gas chamber in a low-pressure regime. In this study, we present the main properties of a low-pressure bulk MM detector in which the amplification gap was slightly increased to improve the gas gain. Two configurations have been deeply studied: the first one with a gap of 128 μm and a second one with 192 μm gap, both filled and operated with a gas mixture (Ar-Co₂) at pressures below 100 mbar. The dependence of the gain and the energy resolution on the amplification field, gas pressure and drift field have been evaluated. The reliability of the measured performance, combined with the simple and robust structure of the detector even with an increased length of amplification gap, make it an attractive choice for applications where track length of low energy particles is detected by using a low-pressure filling gas.

Collaboration

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