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Charge sensitive preamplifier design optimization for low-pressure Micromegas gaseous detector operations

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Using a bulk Micro-Megas (MM) detector a precise energy measurement can be obtained collecting the total charge reaching the mesh electrode connected to a low noise charge sensitive preamplifier. When operating such a device in a low-pressure gas regime, it is necessary to modify the amplification gap geometry to reach the optimal detector gain, reducing the discharge probability between the anode and the mesh with a reasonable avalance volume for track length development and resolution. This implies changes in the input capacity of the preamplifier which influences its signal to noise ratio and thus the detector energy resolution. An ad-hoc high-gain and low-noise charge preamplifier to cope with the requirements of our application field has been developed. In this short report, we present the development activities focused to the study of a configurable charge amplifier to be connected to a MM detector having different mesh capacitances.

Collaboration

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