CHARGE SENSITIVE PREAMPLIFIER DESIGN OPTIMIZATION FOR LOW-PRESSURE MICROMEGAS GASEOUS DETECTOR OPERATIONS

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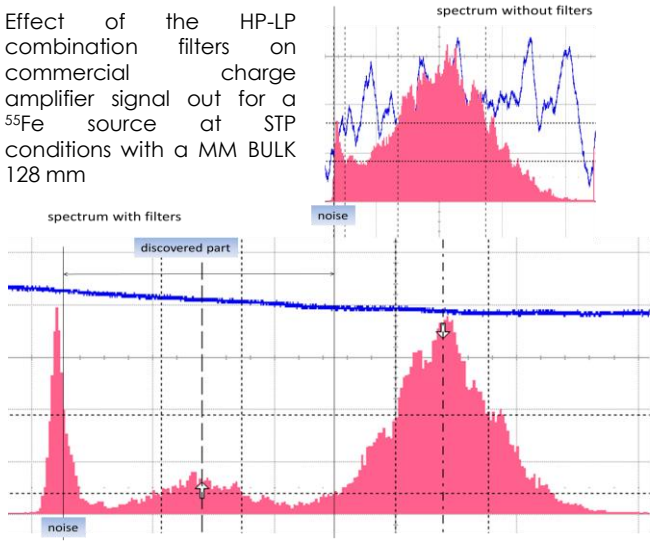
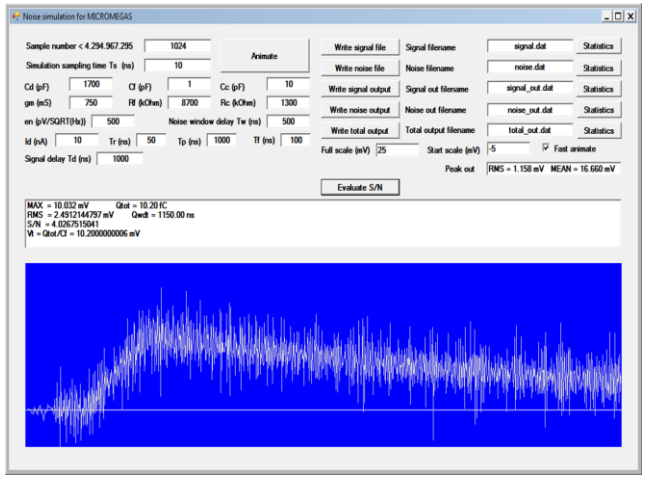
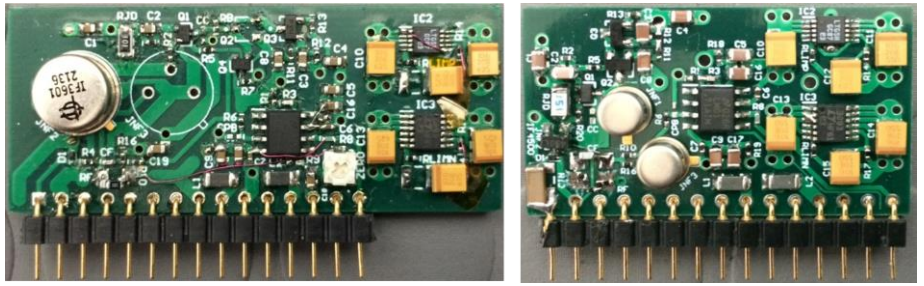
- We operate our Micro-Megas (MM) at low gas pressure to detect low energy (below 100 keV) ionizing particles. A precise energy measurement is obtained collecting the total charge reaching the mesh electrode connected to a low noise charge sensitive preamplifier
- The MM amplification gap geometry must be modified to reach the optimal detector gain. 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. 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.

Effect of the HP-LP combination filters on commercial charge amplifier signal out for a ^{55}Fe source at STP conditions with a MM BULK 128 mm





A time-domain simulator with detector and front-end JFET parameters helps the JFET choice.



Preamplifier prototypes for MM of about 850pF and 50pF mesh electrode capacitance.