

Poster

**GeFRO: A New Readout Circuit for Cryogenic Ionization Detectors with Low Radioactive Background Contribution**

*Lorenzo Cassina (INFN-Milano Bicocca)*

*Co-Authors: L. Cassina, C. Cattadori, A. Giachero, C. Gotti, M. Maino, G. Pessina*

We present GeFRO (Germanium FROntend) a novel approach to the readout of cryogenic ionization detectors. The circuit consists of a very front-end placed close to the detector and made of bare dies: an input common source JFET transistor and a resistor which closes the feedback path for DC restoration of the input node. Due to such a small number of components near the detector, GeFRO shall ensure a minimal impact added on the radioactive background in those experiments where very low signal rates are expected, such as GERDA and MAJORANA. A remote second stage, at room temperature and designed to be either AC and DC coupled, allows the amplification with a rise time of about 20 ns. The two stages can be connected with more than 10 meters of a terminated line whose series resistance very marginally affects the signal amplitude as would happen with a traditional approach. Only two signal cables are necessary for biasing and readout, so that power consumption, crosstalk and mass present in the detector area are minimized. We present the GeFRO performances using a BEGe detector; the results are obtained in the laboratory of the University of Milano Bicocca.