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Performances of Germanium detectors by optimized readout and digital filtering techniques for GERDA Phase II

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GERDA experiment is a new generation experiment searching for neutrinoless double beta decay of 76Ge operating at INFN Gran Sasso Laboratories since 2010.
Coaxial and Broad Energy Germanium (BEGe) Detectors have been operated in LAr in GERDA Phase I.
In the framework of the second GERDA experimental phase, both the contacting technique, the connection to and the location of the front end readout devices are novel compared to those previously adopted, and several tests have been performed.
An optimized pulse filtering method has been developed and applied to the Phase II prototyping tests data sets, and to the full GERDA Phase I data set.
In this contribution the detector performances achieved in GERDA Phase II prototyping tests in term of energy resolution, time stability, waveforms analysis and single-site to multi-site events discrimination will be presented.
The improvement of the energy resolution, compared to the digital shaping adopted for Phase I data analysis, will be discussed and related to the optimized noise filtering capability.
The result is an energy resolution better than 2.6 keV FWHM at 2.6 MeV for the BEGe detectors operated in the Phase II prototyping tests, while, by applying the optimized algorithms to the GERDA Phase I calibration runs, an improvement of about 10% on the energy resolution has been achieved.
GERDA sensitivity to neutrinoless double decay search will take advantage of the improved energy resolution.

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