Poster session 2 - Tuesday 5 July

P2.009 **Improved Digital Filter for GERDA Phase II energy evaluation and Noise Investigations**

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The GERmanium Detector Array (GERDA) experiment, located at the Laboratori Nazionali del Gran Sasso (LNGS) in Italy, searches for the 0nbb decay of Ge-76. GERDA Phase II, started in December 2015, is aiming to reach a sensitivity to the 0nbb decay half-life larger than 10^{26} yr in about three years of physics data taking with 40 detectors and with the background index of about 10^{-3} cts/(keV·kg·yr). To reach these goals the stability, and both the energy and the pulse shape resolutions must be optimal. Digital Filters are a powerful tool to de-noise the Ge detector waveforms and hence allow to improve the resolutions. In this work the results achieved with an Improved Pulse Filtering applied to the recent Phase II data sets will be presented: the method has been developed at the end of Phase I and then tailored to Phase II detectors and configuration. The average energy resolution at the 2.6 MeV line is 3.2 keV (0.12%) and 3.7 keV (0.14%) for BEGes and coaxials respectively. The improvement is about 7% compared to gaussian shaping. This is consistent with what was achieved on Phase I data. The linearity of the detector-readout system is verified. The BEGe energy resolution is found to be limited by factors other than the detector or the readout electronics. The information derived from the improved filter is used to infer and disentangle other noise sources.