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GERDA: latest results of the neutrino-less double beta decay search

Neutrinoless double beta (0nbb) decay experiments are well recognized as the most powerful tool to probe the nature of the neutrino (whether it is Dirac or Majorana particle), determine the absolute neutrino mass scale, and to investigate its mass hierarchy. If positively verified, observation of the 0nbb decay would require physics beyond the Standard Model and, as the only one process, it would allow to experimentally probe effective neutrino masses down to the meV level.

The GERmanium Detector Array (GERDA) experiment, located at the Laboratori Nazionali del Gran Sasso (LNGS) of INFN in Italy, searches for 0nbb decay of the Ge-76 isotope using a matrix of High Purity Germanium detectors enriched in Ge-76 up to about 86%. In the Phase II of the experiment 35.5 kg of enriched germanium detectors is operated in liquid argon. The talk will cover design principles of GERDA, as well as the details concerning newest preliminary results coming from the data unblinding of June 2017 - no signal was observed and the limit on the process was strengthened to T_{½} > 8.0e25 yr (90% CL).

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