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## Status and plans with the GERDA experiment to probe the nature of neutrinos

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Neutrinoless double-beta decay (DBD) could answer the key question regarding the Majorana or Dirac nature of neutrinos and give an answer to the unknown absolute mass scale as well as on the neutrino mass hierarchy. High-Purity Germanium (HPGe) detectors are extremely sensitive tools for the search of neutrinoless DBD. This is demonstrated by the GERDA (GERmanium Detector Array) experiment that is currently searching for the DBD of Ge-76 at the Gran Sasso underground Laboratory of INFN, Italy. In its first phase it will scrutinize the claim of observation of neutrinoless DBD in Ge-76 made by a part of the Heidelberg-Moscow Collaboration. The GERDA experiment is designed to minimize the background by operating HPGe detectors directly immersed in ultra-pure cryogenic liquid.

The GERDA physics run started in November 2011 using about 15 kg HPGe detectors isotopically enriched in Ge-76. The status of the data taking and the most relevant results will be presented.

The spectrum of the neutrino-accompanied DBD of Ge-76 has been observed with unprecedented signal-to-background ratio. A new measurement of the half-life of the neutrino-accompanied DBD of Ge-76 will be given.

For the second phase of GERDA additional ~20 kg of Broad Energy Germanium (BEGe) detectors with favorable properties for improved background recognition are being produced from material enriched in Ge-76. First BEGe detectors with superior energy resolution (1.7 keV at 1.3 MeV) have already been produced and have been characterized. The status of the preparations and further plans for GERDA phase II data taking will be presented.

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