

The Gerda neutrinoless double beta decay experiment: First data from Phase II

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Summary

The neutrinoless double beta decay is a lepton number violating process and if observed would prove the Majorana nature of the neutrino. The Germanium Detector Array (Gerda) experiment, located in the Gran Sasso underground laboratory, Italy, was constructed to search for the neutrinoless double-beta decay of ^{76}Ge . HPGe detectors, isotopically enriched in ^{76}Ge , are operated bare in liquid argon. Phase I was successfully completed with a new lower limit of $T_{1/2} > 2.1 \cdot 10^{25}$ yr (90% C.L.) achieving the aspired background index (10^{-2} cts/keV·kg·yr) in the region of interest. For Phase II the active detector mass has been doubled and an argon scintillation light veto system has been deployed. The expected sensitivity (with a background index of 10^{-3} cts/keV·kg·yr) is $T_{1/2} > 1.4 \cdot 10^{26}$ yr with 100 kg·yr of exposure. After the extensive upgrade Gerda has started data taking in December 2015. The detector array performance and first Phase II data will be presented.

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