UPGRADE OF THE GERDA PHASE II EXPERIMENT

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The GERDA collaboration is performing a sensitive search for neutrinoless double beta decay of ^{76}Ge at the INFN Laboratori Nazionali del Gran Sasso, Italy. After the latest data release performed in the middle of 2018, the total (Phase I + II) exposure of 82.4 kg·yr was achieved, the largest exposure obtained so far by a single experiment searching for 0νββ decay of ^{76}Ge. No signal was observed and a lower limit of $0.9 \cdot 10^{26}$ yr (90 % C.L.) was derived. GERDA collaboration reached important milestones in the 0νββ search with ^{76}Ge in the Phase II by achieving the $6 \cdot 10^{-4}$ cts/(keV·kg·yr) background index and the half-life sensitivity of 10^{26} years.

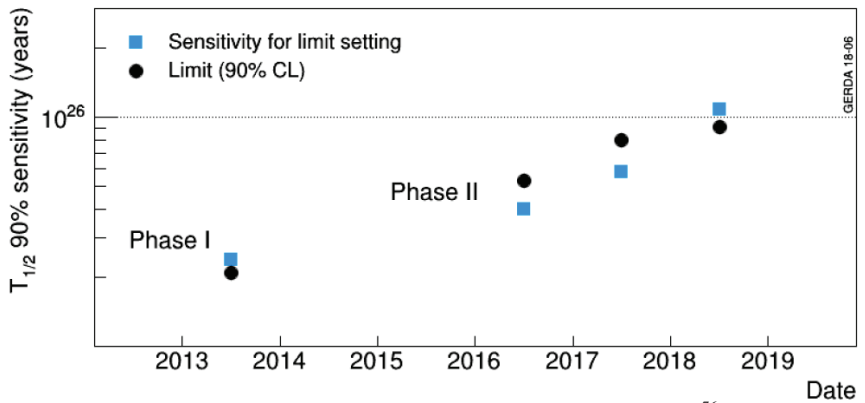

Fig. 2. The improvement of the lower limit of the half-life for 0νββ decay of ^{76}Ge by the Gerda experiment with time.

The upgrade of the GERDA Phase II setup was undertaken in April and May 2018 by improving the liquid argon (LAr) veto instrumentation and by deploying a new type of germanium detectors. The goal of the upgrade was to reduce background and provide tests of the inverted coaxial Ge detectors, which are intended to use in the next large scale experiment.

GERDA will collect data until the end of 2019. The next generation Ge experiment LEGEND-200 aimed to sensitivity of 10^{27} years will take place with modified GERDA infrastructure.