PLANCK 2023 – The 25th International Conference From the Planck Scale to the Electroweak Scale

Contribution ID : 105

The broad physics program of the GERDA experiment

Wednesday 24 May 2023 at 14:50 (00h20')

Content :

The GERDA (GERmanium Detector Array) collaboration operated high-purity Ge detectors enriched in ^{76}Ge to search for neutrinoless double beta decay ($0\nu\beta\beta$). An observation would demonstrate both the Majorana nature of neutrinos and the violation of lepton number conservation, with important consequences for the neutrino mass scale, and the matter-antimatter asymmetry in the Universe. The operation of high-resolution Ge detectors in an active liquid Ar shield combined with a powerful pulse shape discrimination allowed for data collection in a quasi-background-free regime. With a total exposure of 127.2 kg yr, a lower limit on the half-life of $0\nu\beta\beta$ in ^{76}Ge of $T_{1/2} > 1.8 \times 10^{26}$ yr at 90% C.L was set, as the first semiconductor-based experiment to exceed this order of magnitude.

The ultra-low background environment of GERDA motivates searches for other beyond Standard Model processes, such as sterile neutrino or Majoron emissions, bosonic keV-scale dark matter interactions, or baryon number violating single- and multi-nucleon decays.

In this talk, I will review the experimental techniques exploited to reach the final result of the $0\nu\beta\beta$ search, and the rich physics opportunities beyond $0\nu\beta\beta$.

Primary authors : Mr. MUELLER, Yannick (University of Zurich)

Co-authors :

Presenter : Mr. MUELLER, Yannick (University of Zurich)

Session classification : Parallel 12

Track classification : --not yet classified--

Type : --not specified--