38th INTERNATIONAL CONFERENCE
ON HIGH ENERGY PHYSICS
AUGUST 3 - 10, 2016
CHICAGO

Contribution ID: **128** Type: **Oral Presentation**

Search for Neutrinoless Double Beta Decay with the GERDA experiment: Phase II (15' + 5')

Friday, 5 August 2016 15:10 (20 minutes)

The neutrinoless double beta decay ($0\nu\beta\beta$) is a lepton number violating process and if observed it would be a demonstrate the presence of a Majorana term in the neutrino mass.

The GERmanium Detector Array (GERDA) experiment, located at the Gran Sasso underground laboratory in Italy,
is built for the search of $0\nu\beta\beta$ decay in ^{76}Ge.
GERDA operates bare high purity germanium detectors submersed in liquid Argon (LAr).
Phase I of the experiment was successfully completed reaching an exposure of about 21 kg·yr
with the best background level in the field (if normalized to region of interest) of 10^{-2} counts/(keV·kg·yr).
GERDA Phase I set a limit on the $0\nu\beta\beta$ decay of ^{76}Ge of $T^{0\nu}_{1/2} > 2.1 \cdot 10^{25}$ yr.

In Phase II 35 kg of germanium detectors enriched in ^{76}Ge will be operated to reach an
exposure of 100 kg·yr. The design goal of Phase II is to reduce the background by one order of magnitude
to reach the sensitivity for $T^{0\nu}_{1/2} = \mathcal{O}(10^{26})$ yr.

The Phase II setup comprises thirty newly produced Broad Energy Germanium (BEGe) detectors.
The BEGe detectors will contribute to the background reduction with better energy resolution and enhanced pulse shape discrimination capabilities.
To achieve the necessary background reduction, the setup was also complemented with LAr veto.

The hardware upgrade for Phase II was finished and all detectors were deployed in December 2015. We plan to present the first assessment of the performance of Phase II.

Primary author: JANICSKO CSATHY, Jozsef (Technische Unversitat Munchen)

Presenter: JANICSKO CSATHY, Jozsef (Technische Unversitat Munchen)

Session Classification: Neutrino Physics

Track Classification: Neutrino Physics