Search for neutrinoless double beta decay of Ge-76 with the GERmanium Detector Array "GERDA,

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The study of neutrinoless double beta decay is the most powerful approach to the fundamental question if the neutrino is a Majorana particle, i.e. its own anti-particle. The observation of the lepton number violating neutrinoless double beta decay would establish the Majorana nature of the neutrino. Until now neutrinoless double beta decay was not observed.

The GERmanium Detector Array, GERDA is a double beta decay experiment located at the INFN Gran Sasso National Laboratory, Italy. GERDA operates bare Ge diodes enriched in Ge-76 in liquid argon supplemented by a water shield. The exposure accumulated during the Phase I of the experiment adds up to 21.6 kg yr with a background level of 1.8×10^{-2} cts/(keV kg yr).

After an overview of the experiment and the results of Phase I I will discuss the preparation of Phase II with a special regard on the newly produced germanium detectors and the liquid argon veto.