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The GERDA Experiment for the Search of Neutrinoless Double Beta Decay

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GERDA is designed to search for the neutrinoless double beta ($0\nu\beta\beta$) decay, a lepton number violating process. It employs bare high-purity germanium diodes enriched to 86% in ^{76}Ge directly immersed in liquid argon. Phase I operated till May 2013 with a mean background of $1\cdot 10^{-2}$ cts/(keV·kg·yr) near the Q-value. GERDA sets a new lower limit of $T_{1/2} > 2.1\cdot 10^{25}$ yr (90% C.L.) strongly disfavouring the long-standing claim of signal observation. For Phase II, exploring half-lives up to $1.5\cdot 10^{26}$ yr, additional 20 kg of broad-energy Ge detectors will be installed in late 2014. An order of magnitude lower background will be achieved with an active liquid Ar veto and pulse shape analysis. The liquid Ar veto is a hybrid system of wavelength shifting fibres read out by silicon photomultipliers on the one hand and wavelength shifting reflector foils with (vacuum) PMTs on the other hand.

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