



Contribution ID: 468

Type: Poster submission

LEGEND: Searching for Neutrinoless Double-Beta Decay in ^{76}Ge

Monday, August 5, 2019 3:40 PM (20 minutes)

Summary

Neutrinoless Double-Beta Decay ($0\nu\beta\beta$) is a hypothetical process that violates lepton number, and whose observation would unambiguously indicate that neutrinos are Majorana fermions. Because of the long half-life of the decay—current experimental limits indicate $T_{1/2}^{0\nu\beta\beta} > 10^{26}$ yr—at least a tonne-year of isotopic exposure with ultra-low background index of < 0.1 counts/(FWHM-t-yr) in the region of interest of the decay are required. GERDA and the Majorana Demonstrator are currently operating experiments searching for $0\nu\beta\beta$ in ^{76}Ge . Both experiments consist of arrays of P-type Point Contact (PPC) High-Purity Germanium (HPGe) detectors enriched in ^{76}Ge and operating underground. These experiments have achieved the lowest background indexes and best energy resolution of any current-generation $0\nu\beta\beta$ search. By combining the techniques and technologies developed by these experiments, LEGEND (Large Enriched Germanium Experiment for Neutrinoless $\beta\beta$ Decay) will continue the search for $0\nu\beta\beta$ in ^{76}Ge . LEGEND-200 is a 200-kg array of PPC HPGe detectors that will begin operating at LNGS with repurposed GERDA infrastructure in 2021, with a background goal of < 0.6 counts/(FWHM-t-yr). LEGEND-1000 is a planned tonne-scale array that is currently undergoing R&D.

Primary author: GUINN, Ian (University of North Carolina at Chapel Hill)

Presenter: GUINN, Ian (University of North Carolina at Chapel Hill)

Session Classification: Poster Session (Mon/Tue)

Track Classification: Neutrino Oscillations and Masses