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The first results of the LEGEND-200 detector

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The LEGEND experiment is designed to search for neutrinoless double beta decay using Ge-76 enriched high purity germanium detectors that are immersed in liquid argon. LEGEND-200 (L200), operating at LNGS in Italy, builds on the successes in background suppression and analysis techniques from the Majorana Demonstrator and GERDA experiments. L200's first results are based on 61 kgyr of exposure with an estimated background index of $0.5^{+0.3}_{-0.2}$ cts/(keV ton yr). Data from GERDA and the Majorana Demonstrator were combined with L200's for a joint analysis, yielding a 90% CL sensitivity of $2.8x10^{26}$ yr and setting a new lower limit of > 1.9×10^{26} yr, for the half-life of 0vbb. Assuming the decay mechanism is mediated by the exchange of a light Majorana neutrino, this half-life limit corresponds to an upper limit on the effective Majorana mass of mbb < 75-200 meV.

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