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LEGEND-200: First glance at the background in physics data

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The LEGEND Collaboration pursues an experimental program to search for the neutrinoless double-beta ($0\nu\beta\beta$) decay of ${}^{76}\text{Ge}$ with discovery potential at half-lives beyond $T_{1/2}(0\nu\beta\beta) = 10^{28}$ yr. The first phase, LEGEND-200 has started operations at LNGS with 140 kg of HPGe detectors and plans to install additional detectors in the near future. With an exposure of 1 ton-year and a background index in the region of interest of less than $2 \cdot 10^{-4}$ cts/(keV kg yr), LEGEND-200 will reach a sensitivity of $T_{1/2}(0\nu\beta\beta)$ of about 10^{27} years.

In this talk we present initial results based on the first months of data-taking with LEGEND-200. We will discuss the event selection, the analysis and characterization of signal and background event topologies leading to the signal acceptance and the background rejection efficiencies. We will also review our assessment of the background index and the resulting measured final-state energy spectrum, except for the blinded signal region.

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Yes

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