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In-situ characterization of background sources in the NEXT experiment.

The Neutrino Experiment with a Xenon TPC (NEXT) searches for the neutrinoless double beta decay of ^{136}Xe using a high pressure xenon gas time projection chamber. This detector technology has several key advantages, including excellent energy resolution, powerful event classification based on track topology, and favorable mass scalability. The rareness of the decay demands low-background operation and a full understanding of the various background sources. The underground operation of NEXT-White, the first phase of the NEXT experiment, has allowed for full in-situ characterization of the experiment's background.

The talk will be focused on a detailed characterization of the detector-induced backgrounds for the relevant radioactive isotopes (^{208}Tl, ^{214}Bi for $\beta\beta0\nu$ and $\beta\beta2\nu$, ^{60}Co and ^{40}K just for $\beta\beta2\nu$) after 1 year of low-background operation in NEXT-White. In addition to this, we'll go over the relevance of background suppression systems (such as external shielding or radon-free air) in the background levels of the experiment with a data-driven analysis. We will also provide a preliminary estimation of the cosmogenic contribution to our background model. The talk will conclude with a discussion on the impact of the background measurements to NEXT's prospects and physics case.

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