

Simulations, background and sensitivity estimations for the NvDEx experiment

Tuesday, 9 May 2023 15:00 (20 minutes)

I will present the results of the background simulations for the NvDEx experiment. The main sources of background are gamma's and fast neutrons from natural radioactivity as well as cosmogenic-induced activation of nuclei in the materials of the detector.

Gamma's coming from the decay of radioactive contaminations in the materials of the detector will be the main source of background, however the high Q-value of ^{82}Se (~ 3 MeV) puts our Region of Interest above the energy range of most of them, allowing us to reach a very low background rate. Fast neutrons can activate nuclei directly inside the fiducial volume, the most dangerous isotope that can be created is ^{20}F (Q-value ~ 7 MeV): using HDPE shielding it is possible to reduce this background to be lower than gamma's. Even if the cosmogenic activation at CJPL will be negligible, unstable isotopes can still be created while the detector is manufactured on the surface: for this reason, a cooldown period will be required.

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