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Using EXO-200 Results to Make Background Projections for the Next Generation EXO Detector (nEXO) TESSA JOHNSON, Indiana University, ENRICHED XENON OBSERVATORY (EXO) COLLABORATION — Observation of neutrino-less double beta decay would provide a window to new physics, specifically answering questions on the true nature and absolute mass of the neutrino and the validity of lepton number conservation in the Standard Model. The EXO (Enriched Xenon Observatory) collaboration has set a limit on the half-life of this extremely rare decay and continues to take data with the current generation of the experiment, EXO-200, which uses 200 kg of xenon that has been enriched to 80% ^{136}Xe. In order to probe inverted mass hierarchy for neutrinos, it is necessary to build a bigger detector that will have a greater sensitivity to the neutrino-less double beta decay half-life. The next generation of the EXO experiment, dubbed nEXO, is proposed to include a time projection chamber that holds about 5,000 kg of liquid xenon. The main questions to be answered at this stage are what backgrounds will be encountered and how they will affect the physics capabilities with a detector of this magnitude. Data from EXO-200 was used to help determine potential backgrounds from detector materials, shielding materials, and mine rock. This information was used to simulate the backgrounds of nEXO and to estimate its physics reach.

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