Contribution ID: **51** Type: **Poster**

$0\nu\beta\beta$ searches at a theoretical DUNE 4th module

Monday, 10 August 2020 12:10 (15 minutes)

If observed, neutrino-less double beta decay could provide answers for many current mysteries in particle physics, such as the possibility of Lepton number conservation violation, matter-antimatter asymmetry and neutrino mass ordering. This project examined the capability of a theoretical enhanced (through the doping of the detector medium with ^{136}Xe, a double beta decay candidate) Deep Underground Neutrino Experiment 4th module observing a neutrino-less double beta decay. In order to do this, an energy region of interest and optimal minimum distance to the closest wall were found to optimize a fiducial volume for event selection in the presence of a wide variety of the most significant backgrounds. Imperfect detector energy resolution was accounted for by smearing the energy according to a Gaussian distribution. While the detection significance decreased with worsening energy resolution, the optimal energy ROI center was found to improve detection significance by up to a factor of 1.7 when compared to centering the energy ROI at $Q_{\beta\beta}$.

Summary

Primary author: REESMAN, Grace (University of Missouri at Kansas City)

Co-authors: Dr ZENNAMO, Joseph (Fermilab); Dr PSIHAS OLMEDO, Fernanda (Fermi National Accelerator Laboratory)

Presenter: REESMAN, Grace (University of Missouri at Kansas City)

Session Classification: Poster session