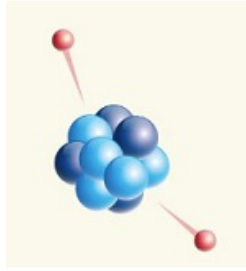


Neutrinoless double beta decay search in Xe - next-generation experiment workshop



Contribution ID : 57

Type : **not specified**

What is the limit of topological background rejection with a gas TPC?

Wednesday, 12 November 2025 16:44 (14)

Gaseous xenon time projection chambers (GXeTPC) are an excellent detector technology for reducing radiogenic backgrounds in $0\nu\beta\beta$ decay searches due to the extended beta tracks. The signal consists of two emitted beta electrons with 2.45 MeV of energy, and their track lengths scale inversely with the gas pressure, reaching ~2 m in size for 1 bar of gas pressure or ~20 cm at 10 bar. The most significant backgrounds that can mimic this signature are gamma rays originating from radiogenic sources or beta decays from cosmogenically activated isotopes such as Xe-137. Such backgrounds generally produce a single electron signature, and GXeTPCs can reject a significant fraction of them using the amount of energy deposition near the track ends and event multiplicities. In this talk, I will be discussing how GXeTPCs can best use the topological information to reject these backgrounds, including the use of new variables that exploit the angular information of the tracks, and what factors can limit this.

Primary author(s) : Dr MISTRY, Krishan (University of Texas at Arlington)

Presenter(s) : Dr MISTRY, Krishan (University of Texas at Arlington)

Session Classification : Blue Sky Session