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Study of the cosmogenic background in Te-LS

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Study of the cosmogenic background in Te-LS [subgroup study]
Hechong Han
The Jiangmen Underground Neutrino Observatory (JUNO) is a world-leading neutrino project, aiming at determining the mass ordering of neutrinos through precise measurements of neutrino oscillations. After the determination of neutrino mass ordering, JUNO Phase II will be used to explore neutrinoless double beta decay beyond the standard model. If a group of nuclides capable of undergoing this decay is universally found in experiments, it would prove that neutrinos are Majorana particles, making neutrinos the first known Majorana fermions. The challenge in detecting neutrinoless double beta decay lies in the extremely low number of rare decay events. Even with a 20-kiloton liquid scintillator in JUNO, the expected number of events observed in a year, with an anticipated 3% mass fraction of Te (natural abundance), would only be of the order of tens at an assumed halflife of 1e28 yr. Therefore, discriminating and reducing background are crucial. This poster will focus on the impact and exclusion strategies of long-lived isotope backgrounds induced by high-energy muons on Te nuclei. The long-lived isotopes yields are calculated using simplified geometries in G4 and fluka. Differences introduced between different hadronic models between G4 and fluka are also compared. Graph neural networks(GNN) are used for background rejection

Poster prize

Yes

Given name

鹤冲

Surname

韩

First affiliation

Institute of High Energy Physics, CAS

Second affiliation

Institutional email

hanhechong@ihep.ac.cn

Gender

Male

Collaboration (if any)

JUNO(on behalf of a sub group)

Primary author: 韩, 鹤冲 (Institute of High Energy Physics, CAS)

Presenter: 韩, 鹤冲 (Institute of High Energy Physics, CAS)

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