Contribution ID: **213** Type: **Poster session only**

Probing Light RHN via Displaced Neutrino Jet Signature at LHeC

We explore the discovery prospect of a relatively light right handed neutrino (RHN) state at the proposed ep collider LHeC, which is planned to operate with 60 GeV electron beam and 7 TeV proton beam. We consider $\tilde{R}_2$ class of leptoquark model, which offers a large production cross-section of RHN along with a jet. For the chosen mass range, the RHN is boosted and can undergoes displaced decay. Therefore, our model signature is unique in nature, which comprises of a prompt jet along with a displaced fat-jet. We use different kinematic variables to separate signal from background, where we show that the ratio variables with respect to energy/number of displaced and prompt tracks can be useful in the identification of displaced decays. We also explore this signature with positron beam, which enhances the detection prospect of a light RHN at LHeC by one order of magnitude.

arXiv number (if applicable)

Primary author: PADHAN, ROJALIN (Institute of Physics, Bhubaneswar)

Co-authors: COTTIN, Giovanna; FISCHER, Oliver; MANDAL, Sanjoy; MITRA, Manimala

Presenter: PADHAN, ROJALIN (Institute of Physics, Bhubaneswar)

Session Classification: Poster Session