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Background simulations on Charged-Lepton Flavour Violation (CLFV) in the Leptoquark framework at the EIC

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The discovery of neutrino oscillations provided evidence of lepton flavour vi- olation. In this work, we carry out the background simulations in the leptoquark framework. Leptoquarks are bosons which carry lepton and baryon numbers, coupling leptons to quarks and mediating charged lepton flavour violation pro- cesses at tree-level. The goal of this work is to study charged lepton flavour violations at the EIC based on the real detector simulations concentrating on three main background events, Charged Current Deep Inelastic Scattering (CC DIS), Neutral Current Deep Inelastic Scattering (NC DIS) and Photoproduc- tion. The plan is to simulate higher statistics of these background events by using the Djangoh MC event generator for neutral and charged currents and Pythia8 for photoproduction while applying selection criteria on higher statis- tical input events compared to what was done before with ECCE.

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