Contribution ID: **145** Type: **Oral report**

Testing Lepton Flavor Universality at the EIC

Lepton flavor universality(LFU), as one of the most important hypotheses in the Standard Model(SM), deserves a high precision test at colliders. Any deviation, if probed, may show us the evidence of the underlying new physics(NP). The Electron-Ion Collider(EIC) has drawn much attention recently. In this work, we will explore the potential of the LFU test and NP search at the EIC. Concretely, we focus on semi-leptonically decayed b-hadrons generated from DIS processes, and compare between tau-mode decays and the other two generations of leptons, where, as reported in many colliders, generally anomalies exist. Different decay channels are taken into account, including $B_c \to J/\psi \ell\nu$, $B_s \to D_s^{(*)} \ell\nu$, $\Lambda_b \to \lambda_c \ell\nu$ and $B_c \to \ell\nu$. We would like to report the possible sensitivity of measurements, and show how these altogether constrain NP parameters.

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Session Classification: 分会场一

Track Classification: TeV 物理和超出标准模型新物理