

CFNS Workshop: High Luminosity-EIC (EIC-Phase II)

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Online

Book of Abstracts

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Status: where we are and ultimate limits

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Beam cooling status and challenges; roadman ahead

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High brightness SRF Gun Overview

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Weak mixing angle extractions

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SMEFT

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Although all known laboratory phenomena are described by the Standard Model (SM) of particle physics, this theory suffers from poorly understood features. Various models beyond the SM (BSM) have been suggested to address these issues. Since there has been no conclusive evidence for new

particles yet, the SM effective field theory can be used to parameterize BSM effects. In this framework, operators built of higher-dimensional interactions of the existing SM particles are introduced together with corresponding Wilson coefficients. In this talk, we focus on dimension-6 semi-leptonic four-fermion operators and demonstrate how asymmetries in neutral-current deep inelastic scattering at the Electron-Ion Collider (EIC) can probe these possible BSM effects. We find that the EIC can provide probes competitive with those coming from LHC Drell-Yan data, and resolve degeneracies that occur in neutral-current Drell-Yan measurements. With a ten-fold luminosity upgrade, these Wilson coefficient constraints become significantly stronger. Designed as a QCD machine, our results show that the EIC also has strong potential for probing BSM physics in ways complementary to the LHC.

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Charge lepton flavor violation

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Intro

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JAM perspective

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Project detector overview and possible bottlenecks

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Polarimetry

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DAQ

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Potential future detector improvements

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