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Physics with Electroweak Probes at the Electron-Ion Collider

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The Electron-Ion Collider (EIC) will be the first facility to collide spin-polarized electrons with polarized protons, polarized light ions, and unpolarized heavy ions at high luminosity. Using the Standard Model electroweak interactions, the EIC will provide unprecedented insights into the structure of nucleons and nuclei and the partonic dynamics inside them. In addition, it will allow for precisely measuring parameters of the electroweak Standard Model itself. Finally, the EIC will open up possibilities to look for rare phenomena beyond the Standard Model complementary to the LHC and fixed target experiments around the world. This talk discusses the capabilities of experiments at the EIC to constrain nucleon structure functions using deep inelastic scattering meditated by W and Z bosons, to measure the weak mixing angle in a new kinematics range, and to search for electron-to-tau charged lepton flavor violation.

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