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Search for Charged Lepton Flavor Violation at the Electron-Ion Collider

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In the Standard Model of Physics (SM) associated with every conservation law there exists a symmetry. While no such symmetry associated with conservation of charge lepton flavors (CLF) has been identified, we still have not observed its experimental violation.Evidence for CLF violation (CLFV) would hence mean existence of physics Beyond the SM (BSM) and is of high interest. The recently approved Electron-Ion Collider (EIC) at BNL with 100-1000 times higher high luminosity than HERA (at DESY, German) will provide a unique new opportunity for such a search. In contrast with the CLFV transition between the e and μ for which very stringent limits exist, there is still relatively large discovery space for the CLFV transition between the e and τ within EIC's reach. With the modern detector designed for the EIC, τs created in e-p scattering at the EIC are expected to be identified with high efficiency. In this talk, we will present results from an ongoing study of sensitivity possible for $e \rightarrow \tau$ conversion in e-p scattering at the EIC.

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