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Studying quasi-real photon structure at EIC

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A future Electron-Ion Collider (EIC) facility will deliver electron-nucleon luminosity of 10^{33} - 10^{34} cm⁻²sec⁻¹ for collisions of polarized electron and protons and heavy ions over a wide range in center-of-mass energies (40 GeV to 145 GeV). One of its promising physics programs is to study the partonic structure of quasi-real photons. By utilizing di-jet measurement in photoproduction events, one can effectively access the underlying parton dynamics of the photon through the selection of the resolved photon components. In this talk, we discuss the feasibility of a di-jet cross section measurement as a function of the jet transverse momentum and tagging resolved photon processes at an EIC. First studies show that the behavior of parton distributions in photon can be well studied at an EIC. The possibility to distinguish between jets originating from gluons and from quarks is discussed to extract information regarding the gluon content in the photon. This work also enables further studies on polarized photon PDFs.

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