

Unveiling Hadronic Mass Generation Through Light Meson Structure with ePIC

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The Electron-Ion Collider (EIC) will be the world's first polarized collider facility that is planned to be operational at the Brookhaven National Laboratory in the early 2030s. One of the key questions that the EIC will address is the emergence of hadronic mass. It has been observed that the elastic electromagnetic form factors of the charged pion and kaon, $F_\pi(Q^2)$ and $F_K(Q^2)$, are rich sources of insights into basic features of hadronic mass generation. One of the ways to determine the form factors is through Deep Exclusive Meson Production (DEMP) reactions at the EIC. My research work involves the development of a first-ever Monte Carlo event generator, DEMPgen [1, 2], to simulate DEMF events and process them through the Electron-Proton and -Ion Collider detector (ePIC) simulations framework to measure the feasibility of these reactions at the EIC. In this talk, I will present the pion form factor projections obtained using recent ePIC simulations and ongoing studies for kaon electroproduction reactions.

[1] <https://github.com/JeffersonLab/DEMPgen/releases>.

[2] Z. Ahmed, R.S. Evans, et al. DEMPgen: Physics event generator for deep exclusive meson production at Jefferson lab and the EIC. *Computer Physics Communications*, 2024.

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