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Probing Light Meson Structure via Tagged Deep Inelastic Scattering

Wednesday, 29 March 2023 09:40 (20 minutes)

This talk will discuss future tagged deep inelastic scattering (TDIS) measurements in Hall A of Jefferson Lab, which will directly probe the elusive mesonic content of the nucleon via the Sullivan process. The idea that the nucleon's mesonic content could be explored through electron nucleon deep inelastic scattering has a long history with the Sullivan process. However, even after five decades of this idea, there is a scarcity of data on meson PDFs. The TDIS experiment will measure low momentum recoiling (and spectator) hadrons in coincidence with deep inelastically scattered electrons from hydrogen (and deuterium) targets. The recently installed and commissioned Hall A Super Bigbite Spectrometer, a large acceptance detector package, will be used to detect the electrons. For the hadron detection, a novel multiple time projection chamber (mTPC) is being developed. Through use of the mTPC, a tagging technique will enhance deep inelastic scattering from partons in the meson cloud and provide access to the pion and kaon structure functions in the valence regime. Since existing world data on light meson structure is extremely sparse and the TDIS measurements will be crucial for shedding light on such topics as emergent hadron mass. This talk will present an overview of the experiment and its status.

Submitted on behalf of a Collaboration?

Yes

Participate in poster competition?

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