Contribution ID: **267** Type: **Oral talk (15 min + 5 min questions)**

Nucleon resonance contributions to inclusive electron scattering

Thursday, 14 July 2022 15:00 (20 minutes)

Experiments with the CLAS detector at Jefferson Lab provided the dominant part of available in the world information on exclusive meson electroproduction in the resonance excitation region. Analyses of these results allow us to obtain electrocoupling of most excited states of the nucleon in mass range up to 1.75 GeV and at photon virtuality Q2 from photon point and up to 5 GeV2 [1]. It made possible, for the first time, evaluate the resonant contribution into inclusive electron scattering observables from experimental results on nucleon resonance electrocouplings [2,3].
The approach and the computational tool developed for evaluation of the resonant contribution into inclusive electron scattering observables will be presented in the talk. We use a relativistic Breit-Wigner ansatz to estimate the resonant contributions to the inclusive electron scattering unpolarized cross sections and to the unpolarized structure functions F1 and F2. In extraction of F1 and F2 structure functions from the data, the experimental results on the longitudinal over transverse cross section ratio RLT available from the Hall A/C measurements [2,4] was used.
The results obtained offer new opportunities for insight into unpolarized parton distribution function (PDF) in the ground state of the nucleon at large values of partial parton momentum x within the resonance excitation region and for exploration of quark-hadron duality. Further extension of this effort in 12 GeV era at Jefferson Lab will allow us to obtain the resonant contributions into inclusive electron scattering within Q2 range up to 10 GeV2, offering a unique information on PDF evolution in the resonance region at the distances where the transition from quark-gluon confinement to perturbative QCD regime of strong interaction is expected.

1. D.S. Carman, K. Joo, and V.I. Mokeev, Few Body Syst. 61, 29 (2020).
2. A. N. Hiller Blin, et al., Phys. Rev. C 100, 035201 (2019)
3. A. N. Hiller Blin, et al., Phys. Rev. C 104, 025201 (2021)
4. V. Tvaskis et al., Phys. Rev. C 97, 045204 (2018)

The speaker is a student or young scientist

No

Section

1. Intermediate and high energies, heavy ion collisions

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