

## Studies of double pion electroproduction with CLAS12 in kinematics with missing hadron

Thursday, 14 July 2022 15:50 (10 minutes)

Exclusive  $\pi^+\pi^-\pi^0$  and  $\pi^+\pi^-\pi^+\pi^-$  electroproduction channels currently represent the major source of information on nucleon resonance ( $N^*$ ) electroexcitation amplitudes. Experiments with CLAS detector on exploration of  $\pi^+\pi^-\pi^0$  electroproduction at Jefferson lab with decisive contribution from Moscow State University group provided information on electroexcitation amplitudes of most excited states of the nucleon in the mass range up to 1.8 GeV. These results offer a unique insight into many facets of strong interaction in non-perturbative regime which underlie the generation of different resonances with different structural features as the bound systems of quarks and gluons. [1,2].

Further extension of the efforts on exploration of  $\pi^+\pi^-\pi^0$  electroproduction with the new CLAS12 detector in the 12 GeV era of experiments at JLab will be presented in the talk. CLAS12 takes data using electron beams with energies up to 11 GeV which allows to probe the structure of nucleon resonances at highest photon virtualities ( $Q^2$ ) ever achieved up to 10 GeV<sup>2</sup>. The event selection of the  $\pi^+\pi^-\pi^+\pi^-$  channel measured in CLAS12 for the kinematics where one final hadron is missing will be presented. The plan for extraction of  $\pi^+\pi^-\pi^0$  differential cross sections will be outlined.

1. Carman D.S., Joo K., Moiseev V.I. et al. // Strong QCD Insights from Excited Nucleon Structure Studies with CLAS and CLAS12, Few Body Syst. (2020) 61, 29.
2. Brodsky S.J. et al. // Strong QCD from Hadron Structure Experiments, International Journal of Modern Physics E Vol. 29, No. 08, 2030006 (2020).

### The speaker is a student or young scientist

Yes

### Section

1. Intermediate and high energies, heavy ion collisions

**Primary author:** BULGAKOV, Aleksandr (Moscow State University, Physics Department)

**Co-authors:** ISUPOV, Evgeny (Moscow State University, Skobeltsyn Institute of Nuclear Physics); GOLUBENKO, Anna (Moscow State University, Skobeltsyn Institute of Nuclear Physics); MOKEEV, Viktor (Thomas Jefferson National Accelerator Facility)

**Presenter:** BULGAKOV, Aleksandr (Moscow State University, Physics Department)

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