Contribution ID: **444** Type: **Talk**

Nucleon electromagnetic form factors at large momentum from Lattice QCD

Monday 29 July 2024 12:55 (20 minutes)

Proton and neutron electromagnetic form factors are some the primary characteristics of their spatial structure. At large momentum transfer Q^2, their behavior probes transition from nonperturbative to perturbative QCD dynamics, diquark correlations, quark orbital angular momenta, as well as other phenomenological assumptions about nucleon structure. Recently at JLab, data on the proton form factors up to $Q^2 = 18$ GeV^2 and the neutron form factors up to 14 GeV^2 have been collected. We will report progress in our lattice calculations of these form factors, including G_E and G_M nucleon form factors with momenta up to $Q^2 = 12$ GeV^2, pion masses down to the almost-physical m_π=170 MeV, several lattice spacings down to $a = 0.073$ fm, high $O(10^5)$ statistics, and disconnected diagrams. We study asymptotic behaviors of the G_E/G_M and F_2/F_1 ratios and separate light-flavor contributions to the form factors, which are both relevant to phenomenology and experiment. Comparison of our calculations and upcoming JLab experimental results will be an important test of nonperturbative QCD methods close to the perturbative regime.

Primary author: SYRITSYN, Sergey (Stony Brook University)

Presenter: SYRITSYN, Sergey (Stony Brook University)

Session Classification: Structure of hadrons and nuclei

Track Classification: Structure of Hadrons and Nuclei