Contribution ID: **100** Type: **Contributed talk**

Nucleon structure with dynamic gluon in the light-front frame

Thursday 2 December 2021 14:35 (15 minutes)

We obtain the light-front wavefunctions (LFWFs) of the nucleon from the light-front quantum chromodynamics (QCD) Hamiltonian, determined for its constituent three-quarks and three-quarks-gluon Fock components, together with a three-dimensional confinement. The eigenvectors of the light-front effective Hamiltonian provide a good quality description of the nucleon electromagnetic and axial form factors, the valence quark distribution functions following QCD scale evolution, and the quark generalized parton distributions functions. We also show various gluon distributions inside the nucleon.

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Session Classification: Parallel Session