

Contribution ID: 190

Type: **Invited**

Light-Front Hamiltonian Approach to Hadrons

Friday, 23 June 2023 12:30 (30 minutes)

Light-front quantization of a Hamiltonian derived from quantum field theory has a long history. The introduction of Basis Light-Front Quantization (BLFQ) has led to the development of Hamiltonians and numerical methods for solving both relativistic bound state and scattering applications in models linked to QCD. For QCD applications in limited Fock spaces, one assumes a form of confinement based on light-front holography along with an additional longitudinal confinement. In applications limited to valence quarks, an effective one-gluon exchange interaction in light front gauge is employed. Recent applications include expanding Fock spaces beyond valence fermions to include the dynamical gauge degrees of freedom. Since the light-front wave functions are interpreted as appropriate to a low-resolution scale, calculated observables such as parton distribution functions (PDFs) can be QCD-evolved to higher scales for comparison with experiments. I will survey comparisons between theory and experiment from recent applications to mesons and baryons and discuss prospects for future developments.

Collaboration

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Session Classification: Plenary session