ID de Contribution: 199 Type: Lecture

Towards a Hamiltonian first principle approach for baryons

mercredi 20 septembre 2023 09:30 (30 minutes)

Basis light-front quantization (BLFQ), as a fully relativistic and nonperturbative approach based on a light-front quantized Hamiltonian with Quantum Chromodynamics (QCD) input, has the potential to achieve the first principle calculation. For QCD applications in limited Fock spaces, we implement a form of confinement based on light-front holography and additional longitudinal confinement in our Hamiltonian. Consequently, BLFQ results agree with the global fitting and experimental data. Recent developments include expanding the Fock spaces to the five-particle Fock sectors, such as the five-quark and three-quark-two-gluon Fock sectors, and implementing the relevant QCD interaction to replace the effective confining potential. Using the light-front wave functions produced by BLFQ, one can calculate observables such as parton distribution functions (PDFs) of the gluon and sea quarks at a low-resolution scale and implement QCD-evolved to higher scales for comparison with experiments. At the end of this talk, I also discuss prospects for future developments.

Auteur principal: XU, Siqi (Institute of Modern Physics, Chinese Academy of Science)

Co-auteurs: MONDAL, Chandan (Institute of Modern Physics, Chinese Academy of Sciences); VARY, James (Iowa State University); NAIR, Sreeraj (The Institute of Modern Physics (IMP) of the Chinese Academy of Sciences); ZHAO, Xingbo (Institute of Modern Physics, Chinese Academy of Sciences); LI, Yang (University of Science and Technology of China)

Orateur: XU, Siqi (Institute of Modern Physics, Chinese Academy of Science)

Classification de Session: Plenary