The parton distributions are important physical quantities measuring internal structures of fundamental particles in the strong interaction. They are also relevant to describing many experimental data of high-energy process and is among one of the scientific targets of the new accelerator Electron-Ion Collider (EIC) planned at Brookhaven National Laboratory in USA.

The lattice QCD is a powerful numerical method to compute the properties of strong-interaction particles based on our current theory of strong interaction, the QCD. In recent years, the lattice QCD has been used to compute the parton distributions. Clearly, a good agreement of the lattice QCD and the experimental data would confirm the status of QCD as the correct theory for strong interaction. For this comparison to be meaningful , one must make sure that the lattice approach to parton distributions is based on solid theoretical foundations. The primary goal of this project is precisely to investigate and cleat up two crucial theoretical issues underlying the lattice approach to parton distributions.