Exploring the Nucleon Sea

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Abstract:

Direct experimental evidence for point-like constituents in the nucleons was first found in the electron deep inelastic scattering (DIS) experiment. The discovery of the valence and sea quark structures in the nucleons inspired the formulation of Quantum Chromodynamics (QCD) as the gauge field theory governing the strong interaction. A surprisingly large asymmetry between the up and down sea quark distributions in the nucleon was observed in DIS and the so-called Drell-Yan experiments. In this talk, I discuss the current status of our knowledge on the flavor structure of the nucleon sea. I will also discuss the progress in identifying the "intrinsic" sea components in the nucleons. Future prospect for detecting some novel sea-quark distributions will also be presented.