

Experiments measuring the polarizability of charged and neutral pions in Jlab

Abstract

The pion polarizability is a fundamental QCD reference point in the confinement region due to the existence of a theoretical prediction of its value in the framework of chiral perturbative theory (ChPT). Therefore, the experimental determination of the pion polarizability with high accuracy is of great importance, providing the most stringent test of the correctness of ChPT as a low-energy representation of QCD.

The polarizability values of charged and neutral pions in the CPP and NPP experiments will be determined using measurements of the Primakoff cross section for the photoproduction of charged and neutral pion pairs on a nuclear target. The data for these measurements were obtained in the summer of 2022 at the Jefferson accelerator facility during the interaction of a polarized photon beam with an energy of 4.5 - 5.8 GeV with lead-208 nuclei at the upgraded GlueX experiment in Hall D.

The talk will discuss existing measurements of pion polarizability, the current status of the CPP/NPP experiments, and preliminary results of the data analysis.