

Consistency check of charged hadron multiplicities and fragmentation functions in SIDIS

Tuesday, 26 July 2016 15:50 (30 minutes)

We derived the conditions on certain combinations of integrals of the fragmentation functions of pion using HERMES data for the sum of the charged pion multiplicities from semi-inclusive deep-inelastic scattering (SIDIS) off the deuteron target. In our derivation the nucleon parton distribution functions (PDFs) are assumed to be isospin SU(2) symmetric. Similar conditions have also been obtained for the fragmentation functions (FFs) of kaon by the sum of charged kaon multiplicities as well. We have chosen several FFs to study the impact of those conditions we have derived. Among those FFs, we find that the fragmentation functions produced by the nonlocal chiral-quark model (NL χ QM) constantly satisfy the conditions. Furthermore, the ratios of the strange PDFs $S(x, Q^2)$ and the non-strange PDFs $Q(x, Q^2)$ extracted from the charged pion and kaon multiplicities differ from each other significantly. Finally, we demonstrate that the HERMES pion multiplicity data are unlikely to be compatible with two widely-used PDFs, namely CTEQ6L and leading order NNPDF3.0.

Presenter: KAO, Chung-Wen (Chung-Yuan Christian University)

Session Classification: Nucleon Structure