

NEW PROSPECTS FOR POLARIZED FRAGMENTATION FUNCTIONS

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The knowledge of hadron fragmentation functions gives a deeper understanding of the hadron structure and of the *hadronization* mechanism for inclusive production. Here we are concerned about the Λ ($\bar{\Lambda}$) hyperons and we will review the present status of their unpolarized and polarized fragmentation functions.

We first recall the results of a QCD analysis of the data for inclusive ($\Lambda + \bar{\Lambda}$) production in e^+e^- collisions in the energy range $14 \leq \sqrt{s} \leq 91.2 \text{ GeV}$, which yields the first simple and reliable parametrization of the unpolarized fragmentation functions $D_f^{\Lambda, \bar{\Lambda}}(z, Q^2)$. The observed longitudinal polarization of the Λ 's produced at LEP on the Z -resonance, leads to some inaccurate information on the spin-dependent fragmentation functions $\Delta_L D_f^{\Lambda}(z, Q^2)$. As we will see, several theoretical models have been proposed for these polarized fragmentation functions which are, so far, badly constrained by the existing data. Some predictions can be made for the spin transfer in polarized deep inelastic scattering, but one gets no definite conclusion by comparing them with the present very poor data from HERMES at DESY and E665 at FNAL. We also stress the importance of the Λ ($\bar{\Lambda}$) production in neutrino (antineutrino) deep inelastic scattering, which allows a clean flavor and spin separation. New data will be soon available from NOMAD at CERN.

We will also give the prospects from pp collisions with polarized protons at BNL RHIC, because there are recent interesting suggestions for measuring the helicity (and transversity) transfer asymmetry in the process $p \vec{p} \rightarrow \vec{\Lambda} X$. From its dependence on the rapidity of the Λ , it is possible to discriminate easily between the various theoretical models, thanks to the high luminosity and the small statistical errors.

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