Collins effect in SIDIS and in electron-positron-annihilation

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The Collins fragmentation function is extracted from HERMES data on azimuthal single spin asymmetries in semi-inclusive deeply inelastic scattering, and BELLE data on azimuthal asymmetries in e^+e^- -annihilations. A Gaussian model is assumed for the distribution of transverse parton momenta and predictions are used from the chiral quark-soliton model for the transversity distribution function. We find that the HERMES and BELLE data yield a consistent picture of the Collins fragmentation function (see Figs. 1 and 2) which is compatible with COMPASS data and the information previously obtained from an analysis of DELPHI data. Estimates for future experiments are made.

THE FIGURES

Figure 1. The observable *P* (*z*1, *z*2) for fixed *z*1-bins as function of *z*2. The data are from the BELLE experiment. The theoretical curves are obtained on the basis of the best fit for the Collins PFF $H_1^{\perp(1/2)a}(z) = C_a z D_1^a(z)$ with $C_{fav} = 0.15$ and $C_{unf} = -0.45$.



Figure 2. The Collins SSA as function of *x* at HERMES and COMPASS. The theoretical curves are a fit to HERMES data with transversity from the chiral quark-soliton model and with the analyzing powers for favored and unfavored fragmentation consistent with that of BELLE data Fig.1.

