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Production of transversely polarized Λ hyperon from unpolarized quark fragmentation in the diquark model

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We investigate the spin-dependent (naive) T-odd fragmentation function D_{1T}^{\perp} , which can provide an explanation on the transverse polarization of the Λ^0 hyperon produced in an unpolarized process. We calculate D_{1T}^{\perp} for light flavors in the spectator diquark model, with a Gaussian form factor at the hyperon-quark-diquark vertex. We include in the calculation both the scalar diquark and axial-vector diquark spectators. We determine the values of the model parameters by fitting the unpolarized fragmentation function D_1^{Λ} to the DSV parametrization for D_1^{Λ} . In addition, we compute the longitudinal polarization fragmentation function G_1^{Λ} and compare it with the known parametrization of G_1^{Λ} . We also estimate the transverse polarizations of Λ production, in both semi-inclusive deep inelastic scattering and single inclusive e^+e^- annihilation.

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