Study on the transverse polarization of Λ and ¯Λ in $e^+e^-$ annihilation at Belle

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Spontaneous hyperon polarization has been a long standing issue for about 40 years. The so called polarizing Fragmentation Function (FF), $D_{1T}^+(z, p_{\perp}^2)$, describes the production of a transversely polarized hadron from an unpolarized quark, where $z$ denotes the fractional energy of the hadron and $p_{\perp}$ the transverse momentum with respect to the fragmenting quark. The polarizing FF can be determined by measurement of the transverse polarization of hyperons. Because of the chiral-even nature, the polarizing FF sign is possible to be unambiguously measured. It provides a unique opportunity to test the universality of the FFs. The large $e^+e^-$ annihilation data sample collected by the Belle experiment at the KEKB storage ring allows a precision study of the production of transversely polarized hyperons and check our current understanding of the associated QCD dynamics. The status of the analysis on the transverse polarization of Λ(¯Λ) in the inclusive production in $e^+e^-$ annihilation at Belle will be presented for both cases of with and without a light hadron to tag the flavor of the quark fragmenting to the Λ(¯Λ).

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