# Polarization analysis of two baryons with various spin combinations produced in electron-positron annihilation

We developed a method to analyze the polarization correlations of two baryons $B_1\bar{B}_2$ with various spin combinations in the annihilation process. We established spin density matrices for arbitrary spins in standard and Cartesian forms, and demonstrated their application in the helicity formalism. This paper provides parametrization schemes for the helicity amplitudes and details the analysis of two baryons with spin combinations of (1/2, 1/2), (1/2, 3/2), and (1/2, 5/2). We also illustrated methods for determining the spin and parity of the excited baryon $\bar{\Xi}^{*+}$ using the $e^+e^- \to \gamma^*/\psi \to \Xi^-\bar{\Xi}^{*+}$ process as an example. Our research offers broad opportunities for exploring the baryon spectrum and transition form factors in electron-positron annihilation.

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