

Probing the chirality of leptoquark couplings in the light of $R_{D^{(*)}}, R_{K^{(*)}}$ puzzle

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Anomalies in recent LHCb and Babar measurements of $R_{D^{(*)}}$, and $R_{K^{(*)}}$ in B decays may indicate the new physics beyond the Standard Model (SM). The leptoquarks (LQ) that couple to the 3rd generation quarks and leptons have been proposed as a viable new physics (NP) explanation. Such left-handed LQs can couple to both bottom and top quarks. Since top particles decay before the hadronization, it is possible to reconstruct chirality of boosted top quarks and consequently the chirality of top coupling to the LQs. We perform analysis on the top quark's chirality in the pair-production channel of the LQ, which can be pure left-handed in comparison to unpolarized $t\bar{t}$ SM background. We study the prospects of distinguishing the chirality of a potential LQ signal for the high luminosity run of the LHC.

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