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Probing spin correlations, entanglement, and Bell nonlocality in bottom quark pairs at the LHC

While spin correlations and spin entanglement have been measured for top quarks at the LHC, they remain unexplored for other quark flavors. We propose analysis strategies for measuring spin correlations, entanglement, and Bell nonlocality in $b\bar{b}$ samples using the partial preservation of the spin information in Λ_b baryons from bottom quark fragmentation. We find that certain measurements are feasible with existing datasets, while others will become possible at the HL-LHC. The proposed measurements will also provide new information on the currently poorly known polarized fragmentation functions.

Secondary track

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