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Hadronic rescattering to solve helicity puzzle in $B^+ \to p\bar{p}\pi^+(K^+)$ decays

Tuesday, March 11, 2025 5:00 PM (15 minutes)

Experimental results indicate opposite helicity angle θ_p distributions in $B^+ \to p\bar{p}\pi^+$ and $B^+ \to p\bar{p}K^+$ decays with the difference presenting a remarkable linear dependence on $\cos\theta_p$.
We assume the production mechanism is driven by $B^+ \to xy\,m^+ \to p\bar{p}m^+$, where $m = \pi$ or K, and xy represents favorable mesonic decay channels producing $p\bar{p}$.
From that, I will present a model that includes three-body final state interaction between the p , $\bar{p}$ and π^+ or K^+ considering the dominance of elastic channels π^+p and $K^+\bar{p}$ interactions below 2\,GeV/c^2.
I will show that our three-body framework with FSI explains qualitatively the observed opposite behavior of the helicity distributions and the observed linearity.

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