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Angular Distribution of polarised Λ_b decay with NP operators

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The recent anomalies in $b \to s\ell^+\ell^-$ transitions could originate from some New Physics beyond the Standard Model. Either to confirm or to rule out this assumption, more tests of $b \to s\ell^+\ell^-$ transition are needed. $\Lambda_b \to \Lambda\ell^+\ell^-$ decay provides us complimentary information of this mode in contrast to the mesonic decay. We will discuss how the polarized Λ_b decay to a Λ and a dilepton pair offers a plethora of observables that are suitable to discriminate New Physics from the Standard Model. In this talk, we will give an overview of how the angular distribution of the Λ_b decay is calculated and present a full angular analysis of a polarized Λ_b decay to a $\Lambda(\to p\pi)\ell^+\ell^-$ final state.
The full angular analysis performed with new scalar and pseudo-scalar operators supplemented with the Standard Model operator basis provides us with 2 new observables which were not present while considering only SM and its chirality flipped counterparts. The full angular distribution is calculated by retaining the mass of the final state leptons. At the low hadronic recoil, we use the Heavy Quark Effective Theory framework to relate the hadronic form factors which lead to simplified expression of the angular observables where short- and long-distance physics factorize. Using the factorized expressions of the observables, we construct a number of test of short- and long-distance physics including null tests of the Standard Model and its chirality flipped counterparts that can be carried out using experimental data. We provide the
the expected experimental precision on these angular observables achievable at the future LHCb. This is mainly based on the paper "Phys.Rev.D 104 (2021) 1, 013002".

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