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Search for Lepton Universality Violation in the Λ_b baryon decays

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In the Standard Model (SM) of particle physics, the couplings of gauge bosons to the charged leptons of different generations are predicted to be identical, up to the order of mass-related corrections. This property is known as Lepton Universality (LU), and an observation of LU violation should be a sign of the New Physics (NP). A variety of tests of LU was performed in the past, generally confirming the SM prediction. However, several recent measurements performed, in particular, by the LHCb collaboration, show hints for LU violation. The most striking of them include the ratios R_K and R_{K^*} , which are defined as ratios of branching fractions $R_H = \text{BR}(B \rightarrow H\mu\mu) / \text{BR}(B \rightarrow H\text{e}\text{e})$. The following measurements are required in order to confirm or reject these hints - and one of them is testing the similar ratio using decays of the Λ_b baryon.

In this talk, the strategy for the measurement $R_{pK} = \text{BR}(\Lambda_b \rightarrow pK\mu\mu) / \text{BR}(\Lambda_b \rightarrow pK\text{e}\text{e})$ will be discussed, as well as dominant complications and prospects for the future.

Summary

Primary author(s) : LISOVSKIY, Vitalii (LAL)

Presenter(s) : LISOVSKIY, Vitalii (LAL)

Classification par session : Physique des saveurs