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【347】Search for the $B^+_{(c)} \to \tau^+\nu_\tau$ decay at LHCb

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The decay process $B^+_{(c)} \to \tau^+\nu_\tau$ offers a direct experimental determination of the CKM element $V_{ub}(V_{cb})$, contributing to precision tests of the Standard Model. Additionally, the observation of this decay holds potential for probing extensions of the Standard Model, e.g. the two-Higgs doublet model and supersymmetry. We aim to measure the $B^+_{(c)} \to \tau^+\nu_\tau$ branching fraction using the decay mode $\tau^+ \to \pi^+\pi^-\pi^+\bar{\nu}_\tau$ at LHCb, which poses a significant challenge due to the presence of two neutrinos in the final state. In this presentation we introduce novel techniques designed for the study of this decay in the challenging hadronic environment of the LHCb experiment.

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