

A Light shed on Lepton Flavor Universality in B meson decays

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In view of the recent measurements of anomalies in semileptonic B meson decays at LHCb and several collider experiments hinting at the possible violation of lepton flavor universality, we will present a concise review of theoretical foundations of the tree- and loop-level b decays ($b \rightarrow cl, \nu_l$) and ($b \rightarrow sl^+l^-$) along with the updated experimental background. We study the q^2 -dependence of form factors for the semileptonic decays and then present the world averages in the updated environment for $R_{D(D^*)}$, $R_{K(K^*)}$, $R_{J/\psi}$ and R_{η_c} , in a model dependent (based on Relativistic independent quark model as well as independent approach. We further provide predictions of other anomalies linked with LFU such as, anomalous magnetic moment of electron and muon by Fermilab (a_μ, a_e), mass of W boson by CDF collaboration, the CKM puzzle ($R(V_{us})$) in view of future high-statistics data, are also discussed. We then look over to the combined explanation of flavour anomalies ($R_{D(D^*)}$, R_K), in the language of effective field theory. As flavor anomalies are the strongest hints for physics beyond standard model, therefore, the confirmation of these measurements would soon turn out to be a remarkable evidence, unravelling the New Physics in the flavour fraternity giving a better understanding on the subject for future experimentalists and theorists.

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