Mini-workshop on D(*) tau nu and related topics

Contribution ID : 9

Upsilon and psi leptonic decays as probes of solutions to the R(D(*)) puzzle

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Content :

Experimental measurements of the ratios R(D(*))=Gamma(B -> D(*) tau nu) / Gamma(B -> D(*) l nu) (l=e, mu) show a 3.9 sigma deviation from the Standard Model prediction. In the absence of light right-handed neutrinos, a new physics contribution to b -> c tau nu decays necessarily modifies also b-bar b -> tau^+ tau^- and/or c-bar c -> tau^+ tau^- transitions. These contributions lead to violation of lepton flavor universality in, respectively, Upsilon and psi leptonic decays. We analyze the constraints resulting from measurements of the leptonic vector-meson decays on solutions to the R(D(*)) puzzle. Available data from BaBar and Belle can already disfavor some of the new physics explanations of this anomaly. Further discrimination can be made by measuring Upsilon(1S,2S,3S) -> tau tau in the upcoming Belle II experiment.

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