



Contribution ID: 26

Type: not specified

Heavy meson decays as precision tools for new physics: A search for beyond Standard Model signals

During the years several tensions were found between experimental results and Standard Model (SM) predictions, in particular in the flavour sector. Individually, these anomalies are not large enough to disprove SM but all together they are telling us that a theory beyond it is required. In particular, measurements of semileptonic B decays are pointing out a violation of the lepton flavour universality (LFU) of the SM, an accidental symmetry broken only by the Yukawa interactions. Furthermore, two different determinations of the Cabibbo–Kobayashi–Maskawa (CKM) matrix elements

$|V_{ub}|$

and

$|V_{cb}|$

from exclusive and inclusive B decays are in tension between them. These issues related to B decays indicate that these processes are an interesting subject to investigate for the presence of new physics (NP) that can explain one or all of the anomalies.

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Session Classification: CKM and CP violation