ICHEP 2022
BOLOGNA

ICHEP 2022   6
XLI   13 07 2022
International Conference
on High Energy Physics
Bologna (Italy)

Contribution ID: **1348**   Type: **Parallel Talk**

Modified HQET power counting for constrained second-order power corrections in $B \to D^{(*)}l\nu$: $R(D^{(*)})$, $|V_{cb}|$ and New Physics

Friday, 8 July 2022 17:00 (17 minutes)

We develop a modified power-counting within the heavy quark effective theory (HQET), that results in a highly constrained set of second-order power corrections in the heavy quark expansion, compared to the standard approach. We implement this modified expansion to determine all $\bar{B} \to D^{(*)}$ form factors, both within and beyond the Standard Model, to $\mathcal{O}(\alpha_s, \alpha_s/m_{c,b}, 1/m_{c,b}^2)$. Using measured $\bar{B} \to D^{(*)}\ell\bar{\nu}$ differential branching fractions for light leptons ($\ell = e, \mu$), we constrain not only leading and subleading Isgur-Wise functions, but also the $1/m_{c,b}^2$ corrections from subsubleading terms. We provide updated precision predictions for $\bar{B} \to D^{(*)}\tau\bar{\nu}$ decay rates, lepton universality ratios, and the CKM matrix element $|V_{cb}|$.

In-person participation

Yes

Primary authors: BERNLOCHNER, Florian (University of Bonn); XIONG, Chenglu (University of Bonn); ROBINSON, Dean (LBNL); PAPUCCI, Michele (Caltech); LIGETI, Zoltan (LBNL); PRIM, Markus (Bonn University)

Presenter: PRIM, Markus (Bonn University)

Session Classification: Quark and Lepton Flavour Physics

Track Classification: Quark and Lepton Flavour Physics