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$B \rightarrow D^{(*)} \ell \nu$ semileptonic decays at non-zero recoil

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A very rich place to look for phenomena to challenge our current understanding of physics is the flavor sector of the Standard Model (SM). In particular, the $|V_{cb}|$ matrix element of the CKM matrix is the subject of a long standing tension, depending on whether it is determined using inclusive or exclusive methods. On top of that, the SM theoretical calculations of some universality ratios $R(X)$ show large, unexplained tensions with experimental measurements.

Recently, there have been interesting efforts in Lattice QCD (LQCD) trying to cast some light onto the current situation. Calculations of the form factors of the gold-plated channels $B \rightarrow D^{(*)} \ell \nu$ at non-zero recoil are becoming the

norm, and when combined with the latest data coming from B factories, they offer promising prospects of settling the matter.

In this talk, I will review the current status of the form factor LQCD calculations at non-zero recoil of the $B \rightarrow D^{(*)} \ell \nu$ channels, and their impact in the determination of $|V_{cb}|$ and $R(D^{(*)})$.

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