

Precision QCD corrections to semileptonic B decays

Wednesday 25 September 2024 14:00 (30 minutes)

In this talk, I will review recent advancements in the calculation of QCD higher-order corrections for semileptonic B decays. Specifically, I will present the next-to-next-to-leading-order corrections to the q^2 spectrum of the inclusive decay $B \rightarrow X_c l \bar{\nu}_l$, which can be utilized to incorporate the recent measurements of q^2 moments by Belle and Belle II into global fits of inclusive semileptonic B decays. Additionally, I will discuss recent results for the third-order corrections to the total width of $b \rightarrow ul\bar{\nu}_l$ decays. These corrections are crucial for evaluating the phase-space ratio $C = |V_{ub}/V_{cb}|^2 \Gamma(B \rightarrow X_c l \bar{\nu}_l) / \Gamma(B \rightarrow X_u l \bar{\nu}_l)$, which appears as normalization factor in the branching ratios of B decays mediated by $b \rightarrow s$ transitions, such as $B \rightarrow X_s \gamma$ and $B \rightarrow X_s l^+ l^-$.

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