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Three-loop QCD corrections to heavy-to-light form factors and applications to inclusive B decays

Monday, July 21, 2025 2:20 PM (20 minutes)

In this talk, we discuss the computation of form factors for decays of heavy into light quarks at third order in QCD for various currents. We describe the different steps of the calculation and use the results to compute the hard matching coefficients in Soft-Collinear Effective Theory for all currents. Further, we extract the hard function in $\bar{B} \to X_s\gamma$ to three loops using the tensor coefficients at light-like momentum transfer and study the impact of three-loop QCD corrections on partial decay rates in charged-current semi-leptonic $\bar{B} \to X_u l\bar{\nu}$ decays, where the newly computed corrections to the vector and axialvector coefficients constitute an essential ingredient to carry out this analysis.

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