

NNLO QCD corrections to $b \rightarrow u l \bar{\nu}_l$: the real radiation

The measurements of inclusive semileptonic B-meson decays allow a precise determination of the CKM matrix elements $|V_{ub}|$ and $|V_{cb}|$, relevant for the study of flavor and CP violation in the quark sector. This requires, from the theoretical counterpart, the calculation of the NNLO corrections to differential decay distributions, from which it is possible to derive predictions for partial decay rates with arbitrary experimental cuts. The two-loop virtual corrections to the decay process $b \rightarrow u W^*$, where b and u are a massive and massless quark, respectively, and W^* is an off-shell charged weak boson, that subsequently decays in a lepton anti-neutrino pair, are known already in the literature. In this poster, we present the calculation strategy and first results concerning the real radiation, necessary to complete the NNLO analysis.

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