

Taming the N3LO correction to semileptonic $b \rightarrow u$ decay

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We present the QCD corrections of order α_s^3 to the decay rate of $b \rightarrow u l \bar{\nu}_l$, originating from diagrams with closed fermion loops and neglecting the mass of the up quark. Our calculation relies on integration-by-parts reduction of Feynman integrals with one propagator raised to a symbolic power in Kira.

The five-loop master integrals are then evaluated with AMFlow numerically, together with an *ad hoc* interface to Kira. This allows us to obtain results for the fermionic contributions to the total semileptonic rate with an accuracy of more than thirty digits

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