

Heavy-quark-pair production at lepton colliders at NNNLO in QCD

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We compute the total cross section of heavy-quark-pair production in e^+e^- annihilation mediated by a virtual photon at the next-to-next-to-next-to-leading order (NNNLO) in Quantum Chromodynamics. The result is expressed as a piecewise function defined by several deeply expanded power series. The result significantly reduces the theoretical uncertainty. For example, for a collision energy of 500 GeV, the scale dependence has been reduced from 0.72% at the next-to-next-to-leading order (NNLO) to 0.15% at the NNNLO, which meets the request by future lepton colliders.

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