

Top and bottom quark A_{FB} at NNLO QCD in (un)polarized electron positron collisions

We consider, at order α^2 in the QCD coupling, top-quark pair production in the continuum at various center-of-mass energies and b -quark pair production at the Z resonance by (un)polarized electron and positron beams. For top quarks we compute the forward-backward asymmetry with respect to the top-quark direction of flight, the associated polar angle distribution, and we analyze the effect of beam polarization on the QCD corrections to the leading-order asymmetry. We calculate also the polarized forward-backward asymmetry. For b -quark production at the Z peak we explore different definitions of A_{FB} . In particular, we analyze b jets defined by the Durham and the flavor- k_T clustering algorithms. We compute the inclusive b -jet and two-jet asymmetry with respect to the b -jet direction. For the latter asymmetry the QCD corrections to order α^2 are small. That predestines it to act as a precision observable.

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