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Transverse momentum resummation for t-channel single top quark production at the LHC

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We study the soft gluon radiation effects for the t-channel single top quark production at the LHC.
By applying the transverse momentum
dependent factorization formalism, the large logarithms about the small total transverse momentum ($q_\perp$)
of the single-top plus one-jet final state system, are resummed
to all orders in the expansion of the strong interaction coupling at the accuracy of Next-to-Leading Logarithm(NLL).
We compare the singular behavior of resummation calculation to fixed order prediction at the small $q_\perp$ region,
and find a perfect agreement. The phenomenological importance of the resummation effect at the
LHC is also demonstrated.

Summary

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