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Is production of charmed hadrons fully perturbative ?

Thursday, 22 November 2018 14:00 (25 minutes)

We discuss production of D mesons at high and low energies. The cross section at high-energies is calculated in the k_t -factorization or standard (collinear) pQCD approach. The unintegrated gluon distributions are the main ingredient of the k_t -factorization approach. Several distributions, in rapidity, transverse momentum, are calculated. The asymmetries observed in production of $D^+ D^-$ and $D_s^+ D_s^-$ mesons observed recently by the LHCb collaboration call for deeper understanding. One of a possibility is nonperturbative light quark/antiquark subleading fragmentation. We have shown that a small amount of such processes, necessary to understand the LHCb asymmetries, may lead to dramatic effects at lower energies or in very forward/backward directions at high-energies. This may also have important implications for high-energy neutrinos observed by IceCube Observatory. Some fixed-target future experiments and relevant predictions will be discussed. I will also discuss production of Λ_c baryons and show difficulties to understand it within independent charm quark/antiquark fragmentation picture.

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