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[Cancelled] Measurement of low p_T D^+ meson production cross section at CDF

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We present a measurement of the production cross section of the D^+ mesons in proton-antiproton collisions at 1.96 TeV center-of-mass energy, using the full data set collected by the CDF experiment at the Tevatron collider during Run II. The measurement is performed in a yet unexplored low transverse momentum range, down to 1.5 GeV/c, using events collected with the “zero bias” and “minimum bias” triggers.

The actual QCD theory cannot predict the behavior of the strong interactions in the low transferred 4-momentum region because in these kinematic conditions the strong coupling constant is of the order of the unity.

Thus, a perturbative expansion is no longer permitted.

At present, several phenomenological models have been proposed, but they are able to describe only few aspects of the observed physical quantities and not their whole complexity. Experimental results in this conditions are then crucial to predict new QCD models. The measurement of the differential cross section at low p_T plays an important role in this context allowing to refine the actual knowledge.

After the shutdown of the Tevatron, this is very likely going to remain a unique measurement because of the initial state (proton-antiproton) and center-of-mass energy.

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