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The Initial Conditions in High-Energy pp Collisions

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The initial conditions in high-energy pp collisions can be well examined from the momentum distributions of both jets and hadrons in these collisions, as they provide relevant information on the collision mechanism and the initial properties of the produced medium. It was found recently that in pp collisions at the LHC, the hadron transverse momentum distributions at central rapidity spanning 14 decades of magnitude over the pT domain from the lowest of ˜0.5 GeV/c to the highest of ˜200 GeV/c can be adequately described by a single Tsallis distribution with only three apparent degrees of freedom [1]. The simplicity of the pT spectrum over such a large pT domain, and the subsequent hard-scattering model analysis of the jet and hadron momentum distributions suggest indirectly that a single mechanism, the hard-scattering between partons, dominates over almost the whole pT domain in these high-energy collisions [2]. Direct evidence of such a dominance is further provided by the experimental observation of the signature for the hard-scattering process, as indicated by the two-particle angular correlations with minimum-pT-biased hadrons [3]. One is led naturally to the initial conditions that in high-multiplicity events in high-energy pp collisions, parallel hard-scattering collisions of partons generate both the jet and the bulk medium whose subsequent collisions lead to the angular correlations of the near-side ridge, as described in the momentum kick model for such correlations [4-7].

[1] C.Y.Wong , G.Wilk, {Tsallis fits to pT spectra for pp collisions at LHC}, Acta.Phys.Pol. B43,247(2012).

[2] C.Y.Wong , G.Wilk, {Tsallis fits to pT spectra and multiple hard scattering in pp Collisions at the LHC}, Phys.Rev.D87,114007(2013).

[3] C.Y.Wong,G.Wilk,L.Cirto,C.Tsallis, {From QCD-based hard-scattering to nonextensive statistical mechanical descriptions of transverse momentum spectra in high-energy pp and p-pbar collisions}, Phys.Rev.D91,114027(2015).

[4] C.Y.Wong, {The Momentum Kick Model Description of the Near-Side Ridge and Jet Quenching}, Phys.Rev.C78:064905,(2008).

[5] C.Y.Wong, {Exploring Early Parton Momentum Distribution with the Ridge from the Near-Side Jet}, J.Phys.G35:104085,(2008).

[6] C.Y.Wong, {Parton Momentum Distribution at the Moment of Jet-Parton Collision}, Chin. Phys. Lett. 25, 3936 (2008).

[7] C.Y.Wong, {Momentum-Kick model description of the ridge in (Delta-phi)-(Delta eta) correlation in pp collisions at 7 TeV}, Phys.Rev.C84:024901,(2011).

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