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Two component model for hadroproduction in high energy collisions (15' + 5')

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Overview of the two component model for hadroproduction based on the recently published papers is presented. The transverse momentum spectra, $d^2\sigma/(d\eta dp_T^2)$, of hadrons produced in high energy collisions can be decomposed into the two components: the exponential ("thermal") and the power ("hard") ones. Thus, charged hadron spectra produced in various interactions (pp, γp, $\gamma\gamma$, heavy-ion collisions) and measured in different experiments from ISR to LHC are considered simultaneously within this model. As a result, it is shown that this model provides a much better description of the available experimental data than other widely used parameterizations (eg. Tsallis). Moreover, the relative contributions of the exponential and power-law components to the spectra vary with the type of the collisions, the type of the produced hadron, the charged multiplicity and the measured pseudorapididty region. The possible mechanism of this effect is discussed: w hile the thermal component might be produced in the fragmentation of the color string due to the effective event horizon introduced by confinement, the power-law term resembles the Regge theory with the perturbative QCD pomeron. Finally, pseudorapidity of a secondary hadron in the moving proton rest frame is shown to be a universal parameter describing a shape of the spectra in pp-collisions.
The observed dependences are used to make predictions on the mean transverse momenta $< p_T >$, pseudorapidity distributions $d\sigma/d\eta$ and double-differential cross-sections $d^2\sigma/d\eta dp_T^2$ at LHC-energies, which are tested on already available experimental data and predictions for future LHC measurements are presented.

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