



ID de la contribución : 40

Tipo : Poster

Universality of identified hadron production in pp-collisions

The shapes of invariant differential cross-sections for identified π^{+-} , K^{+-} , p and \bar{p} production as function of transverse momentum measured in pp collisions by the PHENIX, ALICE and CMS experiments (from 62.4 to 7000 Gev c.m.s. energy) are analyzed in terms of recently introduced approach. Simultaneous fit of these data to the sum of exponential and power-law terms show significant difference in the exponential term (Boltzmann-like) contributions. This effect qualitatively explains the observed shape of the experimental K/π and p/π yield ratios measured as function of transverse momentum of produced hadrons. A picture with two types of mechanisms for hadron production is given. Universality of the second mechanism (pQCD power-law) for π^{+-} , K^{+-} , p and \bar{p} production is shown: the parameters of the power law term take practically the same values which depend on the global conditions like a collision energy rather than a type of produced hadron.

Summary

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Clasificación de temáticas : Strong Interactions and Hadron Physics