High Energy Physics - Phenomenology

Pseudorapidity distributions of produced charged hadrons in pp collisions at RHIC and LHC energies

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The energy dependence of charged-hadron production in proton-proton collisions at RHIC and LHC energies is investigated in a nonequilibrium-statistical relativistic diffusion model (RDM) with three sources for particle production. Calculated charged-hadron pseudorapidity distributions for pp at RHIC energies of sqrt(s) = 0.2 and 0.41 TeV, and at LHC energies of 0.9, 2.36 and 7 TeV are optimized with respect to the available data. Predictions for 14 TeV are made. The central source arising from gluon-gluon collisions becomes the major origin of particle production at LHC energies. The midrapidity dip is essentially determined by the interplay of the three sources.

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