Thermalization temperature in Pb+Pb collisions at SpS energy from hadron yields and midrapidity p_t distributions of hadrons and direct photons

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Abstract

In the frame of 2+1 Bjorken hydrodynamics we describe simultaneously hadron yields and midrapidity p_t distributions of direct photons, unflavored, and strange hadrons measured in Pb+Pb collisions at SpS. We find, that a reasonably quantitative description of these data is possible only if we introduce some radial velocity at the beginning of the one-fluid hydrodynamic stage. We fix uniquely all parameters of this model, and estimate an initial temperature of the just thermalized state $T_{in} = 200^{+40}_{-20}\,MeV$ in the case of EoS with phase transition to Quark-Gluon Plasma, and $T_{in} = 230^{+60}_{-30}\,MeV$ in the pure hadronic scenario. We conclude that SpS data considered in our study can not distinguish between a production of QGP, and its absence.

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