



Contribution ID: 13

Type: **Talk**

Transverse hydrodynamics with sudden hadronization and freeze-out

Wednesday, 14 October 2009 16:00 (30 minutes)

The physical scenario for ultrarelativistic heavy-ion collisions is analyzed where the early dynamics of the system is dominated by the purely transverse hydrodynamic expansion (transverse hydrodynamics [1,2,3]). The local isotropization of the system in the momentum space is described in the schematic way with the help of the Landau matching conditions. The isotropization process is followed by the fast hadronization implemented by THERMINATOR. The model is used to calculate the transverse-momentum spectra, the elliptic flow, and the HBT radii of pions and kaons. A good agreement between the model results and the data is obtained [4].

Our results indicate that the evolution of matter at the early stages of the heavy-ion collisions may proceed far from the local thermal equilibrium. In fact, the purely transverse expansion favors fast building of the transverse radial and elliptic flow. This, in turn, helps to reduce the timescales characterizing the expansion and leads to good description of the HBT radii.

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Session Classification: Dynamics and the Equation of State (1/2)

Track Classification: Investigating Dynamics and the EOS with Correlations