FLUCTUATIONS IN INITIAL ENERGY DENSITY DISTRIBUTIONS IN A + A COLLISIONS

M. S. Borysova, Yu. O. Karpenko, Yu. M. Sinyukov

The analysis of particle correlations as a function of relative pseudo-rapidity and azimuthal angle exhibit novel ridge-like structures that were discovered at RHIC in A + A collisions. Such an analysis is of great interest for forthcoming ALICE LHC experiment. This structure which is unusually wide in the longitudinal direction remains after removal of the known correlation-inducing effects such as elliptic flow and ordinary jet correlations. It could be probably explained only if one supposes that the ridge phenomenon in relativistic A + A collisions is rooted in the initial conditions of the thermal evolution of the system. The aim of this study is to check this hypothesis by an analysis of the evolution of the energy density in the system which at very initial stage of collisions has high density tube-like fluctuations with boost-invariant longitudinally homogeneous structure within some space-rapidity region. The transverse-velocity and energy density profiles, which develop in the system when it reaches the chemical freeze-out (T = 165 MeV) for different initial configurations at $\tau_0 = 0.2$ fm/c, are considered.

Keywords: nucleus-nucleus collisions, hydrodynamics, ridge, fluctuations.