Hydrodynamical Expansion in Ultra-relativistic Heavy Ion Collision – Effect of Phase Transition on Collective Flow –

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Abstract

Using the full (3+1)-dimensional relativistic hydrodynamical model, we evaluate the effect of the phase transition on collective flow By virtue of the *Lagrangian hydrodynamics*, we are able to trace trajectories of the adiabatic paths in the phase diagram. We calculate the speed of sound on trajectories in $T-\mu$ plane, which shows peculiar behavior when QGP and hadron phases coexist, and discuss the relation between the behavior of the collective flow and the equation of states.

We assume the first order phase transition and argue the condition for the incident energy and impact parameter under which the effect of the mixed phase on the flow can be seen clearly.

In collaboration with NAL(National Aerospace Laboratory) in Japan, we present the first computer graphical visualization of (3+1)- dimensional relativistic hydrodynamical model, and study the signal of the production of quark-gluon plasma on flow.

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