

The Sounds of the Big and Little Bangs

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Both in cosmology (the Big Bang) and heavy ion collisions (the Little one) the matter goes through the plasma stages, in which the mean free path of quanta (photons and gluons, respectively) is short. This stage is described by hydrodynamics, and one of the prominent features of it are sounds. At the so called freeze-out time, these sounds are stopped, but not erased, and can be detected. Recent advances in experiments, both at Relativistic heavy ion collider (RHIC) in US and Large hadron collider (LHC) at CERN have provided the first data on higher angular harmonics of the collective flows. Both in cosmology and heavy ion collisions the so called acoustic maxima/minima were predicted and observed: and in both cases fits to those data fix many important global parameters of the problems. Mutual coherence of these harmonics, and perhaps observation of “pre-Big-Bang” events are hot issues now. At the end I will discuss sounds emitted by jets and modern theoretical approaches to study those, using gauge-gravity correspondence.