Title:	Thermodynamic response functions of matter created in ultra-relativistic collisions
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Keywords:	Ultra-relativistic collisions Higher enough energies
Issue Date:	28-Jul-2021
Publisher:	IISERM
Abstract:	According to Big-Bang theory, at the earliest of its expansion, universe existed as QGP. As it cools down, the deconfined-confined phase transition occurred and hadrons were formed. Study about these kind of a stage can lead us to understand the early stages of universe formation. The transformation of matter at higher enough energies, from nucleons to constituent quarks and gluons had been very interesting and equally very challenging. Ultra relativistic high-energy collisions produce matter at extreme conditions of tem- perature and energy density, where a phase transition is expected to take place from hadronic-matter to a phase of quarks and gluons. This phase transition is usually char- acterized by thermodynamic functions such as specific heat, isothermal compressibility and speed of sound. This work presents the study of transverse momentum spectra using the statistical mod- els to calculate the thermodynamical quantities like temperature, volume, etc. These thermodynamic quantities obtained by fitting the transverse momentum spectra with the statistical models are used to estimate the thermodynamic response functions which describe the properties of medium produced during the high energy collisions. We have used the transverse momentum spectra as an observable as it provides the vital information about the dynamics of the produced system. Statistical models such as the Boltzmann-Gibbs, Tsallis, and unified model using the Pearson distribution are used to describe this spectra. The goodness-of-fit of the unified distribution makes it more useful to describe the particle spectra.
URI:	http://hdl.handle.net/123456789/3943
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