Advances in High Energy Physics

Hindawi

Special Issue on

Properties of Chemical and Kinetic Freeze-Outs in High-Energy Nuclear Collisions

CALL FOR PAPERS

The search for a new state of matter and understanding of the conditions of its formation in the extreme conditions of the dense and high-temperature environment are the main goal of the ongoing heavy-ion investigations at CERN LHC and BNL RHIC experiments. The study of these high-energy nuclear collisions is also believed to approach the conditions close to those at the formation of the early universe which has been undergone under extreme dense and temperature. All this makes the studies of the formed nuclear matter a main topic of the today's most theoretical and phenomenological models aimed at describing the conditions and finding the equation of state of the matter formed in heavy-ion collisions at LHC and RHIC believed to be the quark-gluon plasma, predicted by the theory of strong interaction QCD. The understanding of the features observed in nuclear collisions at LHC and RHIC is also believed to provide keys explaining the observations in nuclear collisions at lower energies of the studies planned and ongoing worldwide as well as unexpected nuclear-like findings in pp collisions at LHC such as the ridge correlation phenomenon, enhancement of strange particles production, similarity in the yield dependence on the collision energy, and waiting their understanding.

To clarify the above points, it is crucial to understand the space-time evolution of the system formed during the collisions and resulting into the observed particles, mostly hadrons. In these studies, one distinguishes the two so-called freeze-outs, namely, the chemical freeze-out, the moment when the inelastic scatterings cease, and the kinetic freeze-out, the moment when the elastic scatterings stop, so that the momentum spectra of produced particles are frozen in time. The understanding of this picture is still under wide discussion and attracts a lot of interest, as on the one hand, one assumes the chemical and kinetic freeze-outs occur without any time lag, while on the other hand, there are models considering time interval so that the kinetic freeze-out comes after the chemical one.

We intend to publish a special issue on properties of chemical and kinetic freeze-outs in high-energy nuclear (and particle) collisions, which will address the above discussed points. The editors welcome original research articles as well as review articles from both the theorists and experimentalists.

Potential topics include but are not limited to the following:

- Describing particle distributions and correlations and studying statistical laws and dynamical properties related to the special topic
- Extracting sensitive thermodynamic parameters of chemical and kinetic freeze-outs and studying thermal and dynamical properties of interacting system and formed matters
- Extracting radial flow velocity and describing elliptic flow and other anisotropic flows
- Searching for the softest points of the equation of state and the critical point of hadronic matter to quark-gluon plasma
- Studying collective behavior in small systems

Authors are expected to deposit their manuscript in the arXiv pre-print server prior to submission, under the relevant high energy physics subject area: Experiment (hep-ex), Lattice (hep-lat), Phenomenology (hep-ph), or Theory (hep-th). Articles that are rejected by arXiv for these categories are unlikely to be suitable for the journal.

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/ahep/pckfc/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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