Advances in High Energy Physics

Special Issue on

Global Properties in High Energy Collisions

CALL FOR PAPERS

The collisions at relativistic energy provide a unique environment to explore different kinds of phase transitions related to the formation of the quark-gluon matter and to the confinement phenomena. Studying global properties of final-state particles produced in high energy gives crucial information on the main features of the evolution of the initially created dense gluon system into the stream of final hadrons. In high-energy collisions, these studies help to understand the properties of a strongly coupled quark-gluon plasma (sQGP) by testing various production mechanisms. Global properties, most famously collective flows, were extensively studied at RHIC in BNL, are continuing at the LHC, and will, in the regime of high nucleon density, continue at FAIR and NICA.

Thermal–statistical models and many phenomenological models of initial coherent multiple interactions and particle transport have been introduced to discuss the global properties, such as elliptic flow, jet properties, multiplicity spectrum, and distributions of different kinematic variables. Because of the complexity of QCD in the regime of strong coupling, results on hot quark matter from lattice calculation and hydrodynamic simulation are still lacking the analytic understanding. Further theoretical investigations are of high interest to explain new features observed in high-energy collisions at LHC and to make predictions for future measurements. They will hopefully help to select the most appropriate of the currently existing candidate descriptions of the early stage such as strongly interacting sQGP and color glass condensate (CGC) and make essential progress in understanding the passage to the hydrodynamic regime.

We intend to publish a special issue on the global properties in high-energy collisions. The editors would welcome original research articles as well as review articles from the theorists and experimentalists actively contributing to the field.

Potential topics include, but are not limited to:

- Global properties of final-state particle production
- Global properties of the collision system at high energy and QCD phase transition
- Global observable distributions and dynamical fluctuations in the high-energy collisions
- Transverse momentum (or mass) scaling and elliptic flows at RHIC and LHC
- Description of pseudorapidity distributions and radial flows
- Advances in the properties of QGP at RHIC and LHC
- Thermodynamic properties and transport properties near phase transition
- Heat transfer and fluid flow

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