

International Conference on Physics and Astrophysics of Quark Gluon Plasma (ICPAQGP-2023)



Contribution ID : 50

Type : **Oral Presentation**

Production of light nuclei in Au+Au collisions at STAR

Friday, 10 February 2023 15:40 (15)

The Beam Energy Scan (BES) program at Relativistic Heavy-Ion Collider (RHIC) aims to map the QCD phase diagram. Finite-temperature lattice QCD calculations suggest a smooth crossover transition from normal nuclear matter to the Quark-Gluon Plasma (QGP) phase at high temperature and vanishing baryon chemical potential. Several QCD-based models suggest there is a first-order phase transition between hadronic matter and the QGP at low temperature and high baryon chemical potential, and the first-order phase transition line should end at a critical point (CP) towards the crossover region. The BES program aims to experimentally locate the CP in the QCD phase diagram. It is suggested that light nuclei are formed by the coalescence of nucleons close to each other in phase space. This makes them sensitive to the baryon density fluctuations that become larger in the vicinity of the CP. Therefore, yields and ratios of light nuclei could be an experimental probe to the first-order phase transition.

In this talk, we will present the energy and centrality dependence of transverse momentum spectra of light nuclei (d and t) in Au+Au collisions from the BES-I data. We will also report the energy and centrality dependence of yields and ratios of light nuclei. STAR has also recorded high statistics data from Au+Au collisions at various energies in the BES-II program which comes with enhanced detector capability. The performance of light nuclei analysis in this dataset will be demonstrated.

Primary author(s) : Mr SHARMA, Rishabh (Indian Institute of Science Education and Research (IISER) Tirupati); STAR COLLABORATION

Presenter(s) : Mr SHARMA, Rishabh (Indian Institute of Science Education and Research (IISER) Tirupati)

Session Classification : Parallel Session IVC (Venue : Main Hall/Coral, Prof. Hiranmaya Mishra)

Track Classification : Hadron and light nuclei productions