

Quark Matter 2019 - the XXVIIIth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions



Contribution ID: 747

Type: **Poster Presentation**

Temperature Fluctuation and the Specific Heat in Au+Au Collisions at $\sqrt{s_{NN}} = 7.7 - 200$ GeV from STAR

Monday 4 November 2019 17:40 (20 minutes)

Specific heat is a thermodynamic quantity that characterizes the equation of state of the system. For a system undergoing phase transition, the specific heat, C_V , is expected to diverge at the critical point. Temperature fluctuation of the system provides an estimation of C_V . The specific heat can be extracted from event-by-event temperature fluctuation. Thus the variation of thermal fluctuations with temperature can be effectively used to probe the QCD phase transition and QCD critical point [1].

In this poster, we will present the energy dependence of specific heat and temperature fluctuations of the QCD matter created in Au+Au collisions at $\sqrt{s_{NN}} = 7.7, 11.5, 19.6, 39, 62.4$ and 200 GeV from STAR and compared with model calculations.

[1] Sumit Basu, Sandeep Chatterjee, Rupa Chatterjee, Tapan K. Nayak, Basanta K. Nandi, Phys. Rev. C 94 (2016) 044901.

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Session Classification: Poster Session

Track Classification: QCD at finite temperature and baryon density