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Baryon clustering near a (hypothetical) QCD critical point I

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Clustering in systems with attractive forces are known in many physical settings: for example in formation of globular clusters in Galaxies. Formation of nuclear fragments is a well known phenomenon in low energy nuclear collisions, especially at temperatures $T \sim 10 \text{ MeV}$ near the gas-liquid critical point. At a freezeout stage of high energy collisions, with $T = 100 - 150 \text{ MeV}$, no clustering is generally expected. However, STAR measurement of the proton number distribution has found that kurtosis (the 4-proton cumulant) grows toward the lowest collision energies. Using some version of the mean field approximation and spherical geometry, we study whether the long-range forces, expected near the critical point, can generate *bound* multi-baryon “globular clusters”.

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

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