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Evolving non-Gaussian fluctuations in dynamical relativistic fluid

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First-principle quantitative description of fluctuation dynamics is essential for interpreting the upcoming results of the phase II of the Beam Energy Scan experiment aimed at discovering the QCD critical point. Such a formalism, based on relativistic hydrodynamics, has been developed for *Gaussian* fluctuations previously. Also, in our previous work, the evolution equations for *non-Gaussian* fluctuations of baryon charge density have been derived, but only for *static* and uniform background. Here we shall present an important step towards the general relativistically covariant formalism for non-Gaussian fluctuations of all hydrodynamic variables in a fluid with arbitrary flow. We demonstrate this formalism by focusing on the fluctuations of the hydrodynamic mode dominant near the critical point. This mode involves fluctuations of the baryon charge as well as the energy density. The resulting equations, as expected, differ from those for the baryon diffusion problem and could be now used in a realistic simulation of relativistic hydrodynamics with fluctuations near the critical point.

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