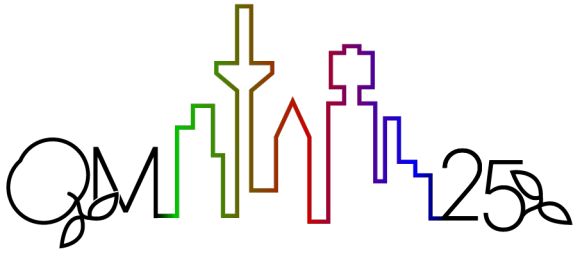

Contribution ID: **1010** Type: **Oral**

Universal critical dynamics near the chiral phase transition and the QCD critical point

We use a novel real-time formulation of the functional renormalization group (FRG), as a valuable tool complementary to classical-statistical simulation, for dynamical systems with reversible mode couplings to study Model H, the conjectured dynamic universality class of the QCD critical point. We emphasize the structural similarities with Model G, conjectured to be the dynamic universality class of the chiral phase transition in the limit of two massless quark flavors. Importantly, our formulation of the real-time FRG preserves all relevant symmetries throughout the FRG flow which, e.g., guarantees the non-renormalization of the reversible mode couplings, as but one exact result. We derive non-perturbative RG flow equations for the kinetic coefficients of both, Model G and H, in parallel, and discuss commonalities and differences in the resulting fixed-point structure and dynamic critical exponents, such as weak scaling relations which hold in either case versus the characteristic strong scaling of Model G which is absent in Model H. For Model G, we also extract a novel dynamic scaling function that describes the universal momentum and temperature dependence of the diffusion coefficient of iso-vector and iso-axial charge densities in the symmetric phase.

Category

Theory

Collaboration (if applicable)

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Track Classification: New theoretical developments