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Fluctuation dynamics near the QCD critical point[1] LIPEI DU, ULRICH HEINZ, Ohio State University, KRISHNA RAJAGOPAL, YI YIN, Massachusetts Institute of Technology — Near the QCD critical point (CP), critically slow processes can invalidate the conventional (dissipative) hydrodynamic description, which simply integrates out all non-hydrodynamic modes. We explore the critical dynamics near the QCD CP with the novel Hydro+ framework which extends the conventional hydrodynamic description by coupling it to additional explicitly evolving slow modes. Their slow relaxation is controlled by the correlation length in the critical region, which is independent from the density inhomogeneities of the QCD matter that control the evolution of the hydrodynamic quantities. In this presentation we study the evolution of a single critical slow mode on top of a simplified matter background with non-zero net baryon density undergoing Gubser flow, as a function of its wave number and the correlation length. We also discuss how the non-equilibrium slow mode affects the bulk properties of the matter, such as the pressure and entropy density. We find that over a wide range of wave numbers the non-equilibrium effects are dominated by the fluid expansion rather than by critical slowing-down. Last but not least we explore the critical fluctuation dynamics in systems of various sizes and at different collision energies.

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