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Critical effects on the evolution of Quark Gluon Plasma

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The study employs second-order viscous hydrodynamics with an equation of state featuring an embedded critical point to study the propagation of linear and nonlinear perturbations in the quark-gluon plasma (QGP). Notably, perturbations dissipate significantly when the QGP approaches the critical point. Consequently, the mach cone effects on away side jet particle correlations vanish. The presence of these dissipative effects also suppresses flow harmonics when the system nears the critical point. Isentropic trajectories near the critical point experience substantial influence, unlike trajectories moving away. This phenomenon could amplify fluctuations in elliptic and higher-order flow harmonics. As a result, the vanishing mach cone effects and the augmentation of flow coefficient fluctuations might serve as signatures for the critical point. This analysis bears relevance for the BES program at RHIC, FAIR energies, and JINR-NICA energies

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