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Spatially inhomogeneous confinement/deconfinement phase transition in rotating QGP

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Using first-principle numerical simulations, we find a new spatially inhomogeneous phase in rotating gluon plasma. This mixed phase simultaneously contains regions of both confining and deconfining states in thermal equilibrium. The location of the spatial transition between the two phases is determined by the local critical temperature. We measure the local critical temperature as a function of angular velocity and radius for a full imaginary rotating system and within a local thermalization approximation, and find good agreement between these approaches. An analytic continuation of our results to the domain of real angular frequencies indicates a profound breaking of the Tolman-Ehrenfest law in the vicinity of the phase transition, with the confining (deconfining) phase appearing farther from (closer to) the rotation axis.

Parallel Session (for talks only)

QCD at nonzero temperature and density

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