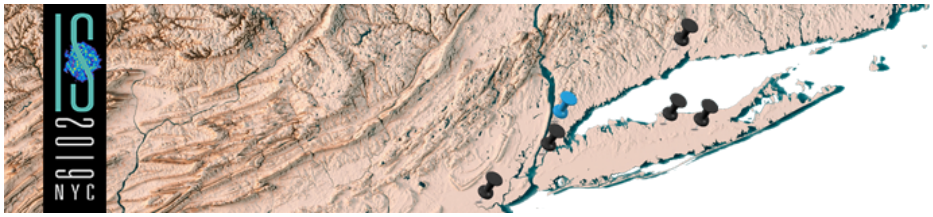

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Self-similarity and spectral functions of non-Abelian plasmas in 2+1D

Tuesday, June 25, 2019 2:40 PM (20 minutes)

To better understand the dynamics of initial stages in heavy-ion collisions, we perform classical-statistical simulations of SU(2) gauge theory in 2+1 dimensions. We find that highly occupied non-Abelian plasmas approach the same 2+1D self-similar state at late times of their far-from-equilibrium evolution, irrespective of details of their initial conditions, and we determine the scaling exponents. We extract the spectral function non-perturbatively and show that for larger momenta than the mass scale p » m, one sees a pronounced peak in the frequency domain, while at low momenta p < m, quasi-particle assumptions become invalid. The hard-thermal loop (HTL) formalism is not applicable to 2+1D gauge theories at low momenta p <= m, and indeed, our results are inconsistent with its predictions. This challenges our detailed understanding of plasma instabilities at initial stages that is mostly based on HTL calculations of highly anisotropic gluonic matter.

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