Organisé conjointement par
CPHT-École Polytechnique et Groupe Théorie IPN Orsay

SÉMINAIRE de PHYSIQUE des PARTICULES

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Hydrodynamization and EoSization in non-conformal theories

Résumé :
Ever since fast hydrodynamization has been observed in heavy ion collisions the understanding of the very early non-equilibrium stage of such collisions has been a topic of intense research. We use the gauge/string duality to model the creation of a strongly coupled Quark-Gluon plasma in a non-conformal gauge theory. This numerical relativity study is the first non-conformal holographic simulation of a heavy ion collision. We extract new physics as compared to the conformal case such as the non-trivial equation of state and the presence of a sizeable bulk viscosity. Non-conformality gives rise to an increase of the relaxation times of the resulting plasma. Furthermore, if the bulk viscosity is large enough then the plasma becomes well described by hydrodynamics before the equilibrium equation of state becomes applicable. This time we refer to as the EoSization time. This EoSization process is a new non-conformal relaxation channel involving the evolution of energy density and average pressure. It is exciting to see this new channel for bulk viscosity values well below QCD critical temperature estimates.

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11:00

Salle de conférences, bât. 6