

Finite coupling correction to heavy quark potential and jet quenching parameter from AdS/CFT

Friday 16 November 2012 11:50 (30 minutes)

Heavy-quark potential and jet quenching parameter are quantities of importance for high energy heavy-ion collision physics and the quark matter. The former can probe the confinement mechanism in the hadronic phase and meson melting in the plasma phase while the later can measure the energy loss of the jet penetrating through the medium. Most of the previous studies from AdS/CFT are for large 't Hooft coupling and large N_c limites.

Our aim is to evaluate the sub-leading terms of strong expansion of heavy-quark potential and jet quenching parameter in N=4SYM plasma from AdS/CFT with world sheet fluctuations.

Applying the AdS/CFT correspondence, the expansion of the heavy-quark potential of the $calN$ supersymmetric Yang-Mills theory at large N_c is carried out to the sub-leading term in the large 't Hooft coupling at nonzero temperatures. The strong coupling corresponds to the semi-classical expansion of the string-sigma model, the gravity dual of the Wilson loop operator, with the sub-leading term expressed in terms of functional determinants of fluctuations. The contributions of these determinants are evaluated numerically. Meson melting will be discussed. We shall also present our new results about the subleading order correction to the jet quenching parameter from AdS/CFT from world sheet fluctuations.

Keywords

Heavy quark potential, jet quenching parameter, AdS/CFT, finite coupling

Authors: Prof. HOU, Defu (Central China Normal University); Mr ZHANG, Zi-qianf (Central China Normal University)

Co-author: Prof. REN, Hai-cang (Rockefeller University & Central China Normal University)

Presenter: Prof. HOU, Defu (Central China Normal University)

Session Classification: Plenary IIIB (Chair Xin-Nian Wang)