Contribution ID: **22** Type: **not specified**

Strong correlations in the QGP at realistic coupling

Sunday 18 January 2015 10:15 (25 minutes)

Experimental results from relativistic heavy-ion collisions at RHIC and LHC have shed light on the strongly coupled nature of the quark-gluon plasma (QGP) in the experimentally available range of temperatures. These features are not within the reach of conventional perturbative methods, such as the Hard-Thermal-Loop (HTL) effective theory, and are deeply related to the lack of infrared stability of the (chromo)magnetic gluons. We present a novel approach which explicitly incorporates effects of color confinement leading to the appereance of a (chromo)magnetic scale at finite temperatures. Firstly, we investigate the collective excitations of hot QCD in order to get a handle of the relevant d.o.f. in a QGP. In stark contrast to conventional HTL expectations, we find three collective modes or quasi-particles (instead of two as from conventional HTL) as well as a modified analytical structure of the relevant propagators. The novel mode is massless and implies positivity violation of the spectral function. Secondly, we also estimate the heavy-quark potential incorporating effects from the (chromo)magnetic scale in order to study the string-breaking mechanism at finite temperatures and their effects on the jet quenching parameter qhat.

Primary author: TYWONIUK, Konrad

Presenter: TYWONIUK, Konrad

Session Classification: Models for heavy-ion collisions