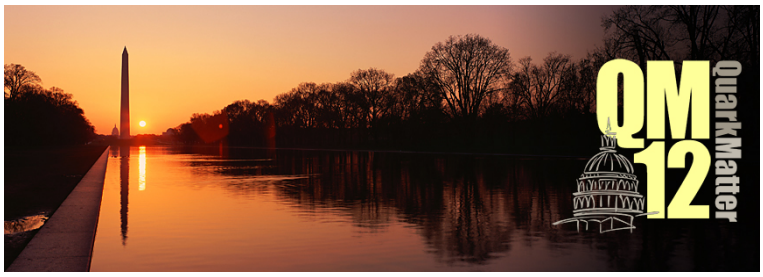

Contribution ID: **120** Type: **Poster**

Constraining properties of the deconfined state of matter with CHIMERA

Thursday, 16 August 2012 16:00 (2 hours)

Constraining properties of the strongly interacting state of matter produced in relativistic heavy ion collisions at RHIC and LHC, such as eta/s and T_{init} is one of the biggest priorities in the field of heavy ion physics. For this purpose, we have developed CHIMERA, a framework for performing global statistical evaluation of multiple QGP signatures by comparing key soft observables (spectra, HBT and elliptic flow) measured at LHC and RHIC to the results from our multi-stage hydrodynamics/hadron cascade model of heavy ion collision. The unique feature of CHIMERA is that both statistical and systematic uncertainties are used in the evaluation procedure, and these uncertainties are fully propagated in the
determination of the temperature and viscosity to entropy ratio.

The CHIMERA model incorporates different initial state conditions, pre-equilibrium flow, the UVH2+1 viscous hydro model, Cooper-Frye freezeout, and the UrQMD hadronic cascade model. For hydrodynamical evolution, several different equations of state (EoS) , including those derived from the hadron resonance gas model and lattice QCD, are used to test the sensitivity of the observables to a particular choice of EoS.

For a particular selection of initial conditions and pre-equilibrium flow we consider T_{init}-eta/s grid. For each grid point and a particular observable we evaluate the extent of agreement between the model and experimental data by calculating chi-squared values. The latest CHIMERA results of comparing LHC data to the results from our heavy ion collision model optimized for LHC energies will be presented.

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Session Classification: Poster Session Reception

Track Classification: Global and collective dynamics