Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Anisotropic Jet Quenching in semi-Quark-Gluon Plasmas with Magnetic Monopoles JIECHEN XU, Columbia University, JINFENG LIAO, Indiana University, MIKLOS GYULASSY, Columbia University — We present a new jet quenching framework, CUJET3.0, that is shown to simultaneously account for both the high p_T single inclusive hadron suppression R_{AA} and its azimuthal anisotropy v_2 in heavy ion collisions at both RHIC and LHC energies. CUJET3.0 generalizes our previous pQCD/HTL based CUJET2.0 model that couples running coupling DGLV jet energy loss to (2+1)D viscous hydrodynamic fluids, and it includes two new nonperturbative effects in the QCD transition temperature range $T \sim 140 - 250$ MeV: (1) the Polyakov loop suppression of color-electric scattering (aka "semi-QGP" of Pisarski et al) and (2) the enhancement of scattering due to emergent magnetic monopoles near T_c (aka "magnetic scenario" of Liao and Shuryak). The parameters of the model are constrained by lattice QCD data. We find that the CUJET3.0 jet transport coefficient $\hat{q}(E,T)/T^3$ peaks near T_c by a factor ~ 4 above previous perturbative pQCD/HTL estimates, approaching hybrid AdS/SYM holography of Liu et al, but it has very strong nonconformal E and T dependence up to $T \sim 400$ MeV. Extrapolating down to $E = 2$ GeV, we find a striking new connection between bulk perfect fluidity with $\eta/s \sim 0.1$ near T_c and high p_T high T perturbative jet quenching.

Jiechen Xu
Columbia University

Date submitted: 09 Jan 2015 Electronic form version 1.4