Abstract Submitted
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Quest for the Degrees of Freedom in sQGP: An Electric-Magnetic Duality Perspective[1] JINFENG LIAO[2], EDWARD SHURYAK, SUNY Stony Brook — Based on monopoles and generic E-M duality, we have recently suggested a "magnetic scenario" [PRC75:054907,2007] for quark-gluon plasma in 1-2T_c region (known as sQGP) — a plasma in which monopoles become light, weakly coupled, and dominant d.o.f near T_c, while electric particles (quarks and gluons) are forced to become heavy and strongly coupled, eventually confined. This picture has been supported by several independent lattice results. In particular our "magnetic scenario" predicted that electric/magnetic effective coupling should run in opposite direction as temperature changes. This was confirmed in our paper [arXiv:0804.0255[hep-ph]] by analyzing recent accurate data about lattice monopoles. As applications of the "magnetic scenario", we were able to show: (1) a strongly coupled plasma with equally mixed electric and magnetic charges has the desired transport properties very close to the "perfect liquid" observed at RHIC; (2) the dense monopole plasma at $T = (0.8 - 1.3)T_c$ could support metastable flux tubes between $\bar{Q}Q$ and allow us to explain the non-trivial T-dependence of the static $\bar{Q}Q$ potentials calculated on the lattice, see [Phys. Rev. C 77: 064905, 2008] and [arXiv:0804.4890 [hep-ph]].

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