

Transport properties of the fluid produced at RHIC

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It is by now well known that the relativistic heavy-ion collisions at RHIC, BNL have produced a strongly interacting fluid with remarkable properties, among them the lowest ever observed ratio of the coefficient of shear viscosity to entropy density (η/s). Causal viscous hydrodynamics calculations have pinned down this ratio, in the relevant temperature regime, to within a small factor of the absolute theoretical lower limit $\eta/s = 1/4\pi$, conjectured from the ADS/CFT correspondence. Less well-determined is the ratio of the coefficient of bulk viscosity to entropy density. These transport coefficients have also been studied in the lattice QCD framework and perturbatively in the limit of high-temperature QCD. Another interesting transport coefficient is the coefficient of diffusion which is also being studied in this context. I will review some of these recent developments and then discuss the opportunities presented by the anticipated LHC data, for the general nuclear physics audience.

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