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## Shear Viscosity to electric conductivity ratio for the Quark-Gluon Plasma

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Transport coefficients of strongly interacting matter are currently subject of intense studies due to their relevance for the characterization of the quark-gluon plasma (QGP) produced in ultra-relativistic heavy-ion collisions (uRHIC).

We discuss the connection between the shear viscosity to entropy density ratio,  $\eta/s$ , and the electric conductivity,  $\sigma_{el}$ : we find that a minimal  $\eta/s$  is consistent with a low value of electric conductivity as measured in recent lattice QCD calculations.

More generally we show that the ratio of  $\eta/s$  over  $\sigma_{el}/T$  supplies a measure of the quark to gluon scattering rates whose knowledge would allow to significantly advance in the understanding of the QGP phase.

We also predict that  $(\eta/s)/(\sigma_{el}/T)$ , independently on the running coupling  $\alpha_s(T)$ , should increase up to about  $\sim 20$  for  $T \rightarrow T_c$ , while it goes down to a nearly flat behaviour around  $\simeq 4$  for  $T \geq 4T_c$ .

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