19th International Conference on
QCD in Extreme Conditions (XQCD 2023)

Contribution ID: **85** Type: **Poster**

Unveiling the shear viscosity to entropy density ratio with gravity analogs

Wednesday 26 July 2023 19:35 (25 minutes)

One of the most intriguing aspects of strongly coupled quark gluon plasma is near perfect fluidity observed in relativistic heavy-ion collisions. One way of quantifying this property is by means of the shear viscosity to entropy density ratio η/s. Within the AdS/CFT correspondence, it has been conjectured by Kovtun, Son and Starinets that a universal lower bound $1/4\pi$ exists. We present a new perspective on this matter in the framework of analogue gravity models, focusing on relativistic fluids with transonic flow. Quantum fluctuations
at the acoustic horizon, the fluid analog of the event horizon of a black hole, result in a thermal radiation of phonons, the sonic analog of the Hawking radiation. Adopting a covariant relativistic kinetic theory, we describe
the Hawking emission as a dissipative process. Neglecting phonon's self interactions, we find the saturation of η/s. We connect the KSS bound to the absence of a gap in the low energy spectrum of long-wavelength excitations.

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Session Classification: Poster session