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Shear viscosity at large baryon densities

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The HADES experiment at GSI has recently provided data on the flow coefficients v_1, \dots, v_4 for protons in Au+Au reactions at $E_{\text{lab}} = 1.23$ AGeV (or $\sqrt{s_{\text{NN}}} = 2.4$ GeV). This data allows to estimate the shear viscosity over entropy density ratio, η/s , at low energies via a coarse graining analysis of the UrQMD transport simulations of the flow harmonics in comparison to the experimental data. By this we can extract the space and time dependence of the η/s ratio and provide for the first time an estimate of $\eta/s \approx 0.65 \pm 0.15$ (or $(8 \pm 2) (4\pi)^{-1}$) for baryon rich matter at such low energies.

[1] T. Reichert, G. Inghirami and M. Bleicher, Phys.Lett.B 817 (2021) 136285

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