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Baryon density dependence of viscosities of the QGP at hadronization

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The Phi meson and Omega baryon provide unique probes of the properties of the quark-gluon plasma (QGP) at hadronization in relativistic heavy-ion collisions. Using the quark recombination model with the quark phasespace information parameterized in a viscous blast wave, we perform Bayesian inference of the shear and bulk viscosities of the QGP at hadronization with a temperature of T ≈ 160 MeV by analyzing the phi and Omega data in Au+Au collisions at √sNN = 19.6–200 GeV and Pb+Pb collisions at √sNN = 2.76 TeV, corresponding to a baryon chemical potential variation from μB ≈ 0 to 200 MeV. We find that the shear viscosity to enthalpy ratio of the QGP at hadronization decreases as μB increases, while the corresponding specific bulk viscosity is essentially constant for μB < 200 MeV. Our results suggest that the QGP at hadronization (T ≈ 160 MeV) with finite baryon density is more close to perfect fluid than that with zero baryon density.

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