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Title:	Dissipative properties and isothermal compressibility of hot and dense hadron gas using non-extensive statistics
Authors:	Tiwari, Satish Kumar (/jspui/browse?type=author&value=Tiwari%2C+Satish+Kumar) Kakati, N. (/jspui/browse?type=author&value=Kakati%2C+N.)
Keywords:	hadron gas isothermal compressibility non-extensive statistics hot and dense
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Abstract:	We evaluate the transport properties such as shear viscosity (η), bulk viscosity (ζ) and their ratios over entropy density (s) for hadronic matter using relativistic non-extensive Boltzmann transport equation (NBTE) in relaxation time approximation (RTA). In NBTE, we argue that the system far from equilibrium may not reach to an equilibrium described by extensive (Boltzmann-Gibbs (BG)) statistics but to a q-equilibrium defined by Tsallis non-extensive statistics after subsequent evolution, where q denotes the degree of non-extensivity. We observe that η/s and ζ/s decrease rapidly with temperature (T) for various q-values. As q increases, the magnitudes of η/s and ζ/s decrease with T. We also show the upper mass cutoff dependence of these ratios for a particular q and find that they decrease with the increase in mass cutoff of hadrons. Further, we present the first estimation of isothermal compressibility (κ_T) using non-extensive Tsallis statistics at finite baryon chemical potential (μ_B). It is observed that, κ_T changes significantly with the degree of non-extensivity. We also study the squared speed of sound (c_{2s}) as a function of temperature at finite baryon chemical potential for various q and upper mass cutoffs. It is noticed that there is a strong impact of q and mass cutoff on the behaviour of c_{2s}.
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