Contribution ID : 25

A New Equation of State for a Hot Hadronic Matter

Content :

The properties and signals of quark- gluon plasma (QGP) formed in the ultrarelativistic collisions of two heavy nuclei in the laboratory can not be properly diagnosed unless we have a proper understanding of an equation of state (EOS) for a hot and dense hadron gas. In this paper, we propose a new EOS for hadron gas which contains all meson and baryon resonances upto a cutoff mass of 2 GeV and we incorporate a hard- core repulsion between two baryons in a thermodynamically consistent excluded volume approach. We find that our approach yields various curves for pressure, baryon number density, entropy density and energy density which show a close agreement with the results obtained from a microscopic simulation approach of Sasaki et al. [Progress of Theoretical Physics,106,783 (2001)]. We also show a detailed comparison of various freeze-out criteria obtained in the literature and on re-examination, we find that E/N = 1.0 describes well the freeze-out points and their energy dependence. We have further demonstrated the validity of our model by deducing the model yields for K+/pi+ and K-/pi- and on comparison with the experimental data, we find that the agreement is good. We thus infer that our EOS gives a satisfactory description of hot, dense hadron gas and it can further be used for the diagnostic purpose of QGP.

Primary authors : Mr. TIWARI, Swatantra Kumar (B. H. U., Varanasi, India)

Co-authors : Mr. SRIVASTAVA, Prashant Kumar (B. H. U., Varanasi, India) ; Prof. SINGH, C. P. (B. H. U., Varanasi, India)

Presenter : Mr. TIWARI, Swatantra Kumar (B. H. U., Varanasi, India)

Session classification : --not yet classified--

Track classification : --not yet classified--

Type : --not specified--