Pressure, Energy Density and Related Quantities for the Description of the Mixed Hadronic-QGP Phase System, Computed with Mathematica

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Abstract

We describe the thermal deconfinement phase transition from a hadronic phase consisting of nucleons to a Quark-Gluon Plasma (QGP) phase of *u, d* and s quarks within their antiquarks and gluons, by means of a thermodynamical approach in which we investigate the pressure, the energy density and some related quantities. The computation of these quantities has been done using Mathematica software, and their graphical variations have been illustrated in 2D and 3D plots, with varying temperature and volume at zero chemical potential. The obtained results have been analysed and compared with those of previous works [1, 2, 3] carried out for a transition from a pionic hadronic phase to a QGP with *u* and *d* quarks.

Keywords

Deconfinement Phase Transition, Quark-Gluon Plasma, Energy density, Mathematica Computing System.