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Heavy flavor deconfinement, strangeness freeze-out and equation of state at nonzero density

We utilise our recent lattice QCD results on fluctuations and correlations of conserved charges to show that both strange and charm hadrons start to deconfine in the chiral crossover region of QCD. These lattice QCD calculations also provide evidence for the presence of additional, experimentally yet unobserved open charm and strange hadrons below the QCD crossover. We also show that when these additional strange hadrons are taken into account, they yield a lower value of the freeze-out temperature for strange hadrons. Finally, we present results for the lattice QCD equation of state at nonzero baryonic chemical potential. The lattice QCD equation of state is well controlled upto baryon chemical potential of about 300 MeV corresponding to RHIC BES runs down to $\sqrt{s_{NN}}=12$ GeV.

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