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Deconfinement and freeze-out in heavy ion collisions SWAGATO MUKHERJEE, Brookhaven National Laboratory — Based on Lattice QCD calculations of fluctuations and correlations of various conserved charges we show that the deconfinement of strangeness takes place in the chiral crossover region of QCD; however, inside the quark-gluon plasma strange quarks remain strongly interacting at least up to temperatures twice the QCD crossover temperature. We also show that the freeze-out parameters of heavy-ion collisions can be determined model independently through direct comparisons between the Lattice QCD calculations and the experimentally measured higher order conserved charge cumulants. Utilizing the preliminary data for various higher order conserved charge cumulants measured by the STAR and PHENIX experiments we present a Lattice QCD based determination of the freeze-out parameters and show that, for moderately small baryonic densities, the freeze-out take place very close the chiral/denconfiment crossover region of QCD.

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