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Strangeness at high temperatures

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Appropriate combinations of up to fourth order cumulants of net strangeness fluctuations and their correlations with net baryon number and electric charge fluctuations, obtained from ab-initio Lattice QCD calculations, have been used to probe the strangeness carrying degrees of freedom at high temperatures. For temperatures up to the chiral crossover separate contributions of strange mesons and baryons can be well described by an uncorrelated gas of hadrons. Such a description breaks down immediately after the chiral crossover region, suggesting that the deconfinement of strangeness takes place at the chiral crossover. On the other hand, the strangeness carrying degrees of freedom inside the quark gluon plasma can be described by a weakly interacting gas of quarks only for temperatures larger than twice the chiral crossover temperature. In the intermediate temperature window these observables show considerably richer structures, indicative of the strongly interacting nature of the quark gluon plasma.

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