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Cumulant ratios of net baryon-number fluctuations at small values of the baryon chemical potential

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We calculate ratios of up to 4^{th} order cumulants of net baryon number fluctuations in (2+1)-flavor QCD using
next-to-leading order Taylor expansions in terms of temperature and the the baryon number, strangeness, and electric charge chemical potentials. We establish relations between these cumulant ratios, which hold at small values of the chemical potentials. These QCD results are in contrast to hadron resonance gas model calculations where, for instance, the kurtosis ratio, $\kappa_B\sigma_B^2 = \chi_4^B/\chi_B^2$ and the skewness ratio $S_B\sigma_B = \chi_3^B/\chi_B^1$ are unity
at all values of the temperature and baryon chemical potential. We show that the experimentally observed pattern
of net proton-number fluctuations for beam energies larger than 19.6 GeV is in qualitative agreement with the next-to-leading order lattice QCD calculations.
We also present updates of our calculation of the QCD equation of state in a 6^{th} order Taylor expansion.

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