

# Net-baryon-, net-proton-, and net-charged particle kurtosis in heavy-ion collisions within a relativistic transport approach

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We explore the potential of net-baryon, net-proton and net-charge kurtosis measurements to investigate the properties of hot and dense matter created in relativistic heavy-ion collisions. Contrary to calculations in a grand canonical ensemble we explicitly take into account exact electric and baryon charge conservation on an event-by-event basis. This drastically limits the width of baryon fluctuations.

A simple model to account for this is to assume Poisson distributions with a sharp cut-off at the tails. We present baseline predictions of the energy dependence of the net-baryon, net-proton and net-charge kurtosis for central ( $b \leq 2.75$ -fm) Pb+Pb/Au+Au collisions from  $E_{lab} = 2A$ -GeV to  $\sqrt{s_{NN}} = 200$ -GeV from the UrQMD model. While the net-charge kurtosis is compatible with values around zero, the net-baryon number decreases to large negative values with decreasing beam energy. The net-proton kurtosis becomes only slightly negative for low  $\sqrt{s_{NN}}$ .

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