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Correlations from global baryon number conservation

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The search for the predicted first-order phase transition and the corresponding critical endpoint between the hadronic matter and quark-gluon plasma is one of the most important current challenges in high-energy physics. This problem can be addressed based on the fluctuations of e.g. net-baryon number, net-charge, or net-strangeness number measured in relativistic heavy-ion collisions. The factorial cumulants, which represent the integrated genuine multi-particle correlation functions, can be applied to quantify such fluctuations and correlations. However, the effects other than related to the first-order phase transition, e.g. the impact parameter fluctuation or correlation laws, can also generate the correlations. In this talk, the number of particles factorial cumulants originating from the global baryon number conservation will be presented. The inclusion of the short-range correlations assumption and its consequences will also be discussed. The feasibility of testing our formulas for the factorial cumulants will be mentioned.

Primary author: BAREJ, Michał

Co-author: BZDAK, Adam (AGH University of Science and Technology, Poland)

Presenter: BAREJ, Michał

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