Recent results on event-by-event fluctuations in ALICE

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One of the key goals of nuclear collision experiments is to map the phase diagram of strongly interacting matter. At LHC energies there would be, for vanishing light quark masses, a temperature-driven genuine phase transition of second order between the hadron gas and the quark-gluon plasma. For realistic quark masses, however, this transition becomes a smooth cross over. Nevertheless, due to the small masses of current quarks one can still probe critical phenomena at the LHC energy, which can be confronted with the ab-initio LQCD calculations at vanishing baryon chemical potential. In this report recent results on event-by-event fluctuation measurements in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ and 5.02 TeV will be presented. Together with the measured first four cumulants of net-protons in Pb-Pb collisions, differential studies on the second moments of net-charge distributions and their evolution from pp through p-Pb, Xe-Xe to Pb-Pb interactions will be highlighted. The obtained experimental results will be compared with the corresponding model calculations.

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