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Net baryon cumulants in viscous hydrodynamics

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A valuable tool used in the search for QCD's critical point is the computation of cumulants of conserved charge. Near this point, it is expected a sharp increase of this quantity due to divergence of correlation lengths. This calculation requires high statistics, which poses a challenge to hydrodynamics simulations, which tends to be computationally expensive. The issue can be ameliorated by means of a procedure called oversampling, i.e. one repeats the Monte Carlo step of the particlization many times for a single hydro event. However, this has the drawback of removing effects of fluctuations caused during the particlization. We use a toy model to demonstrate a method to compute cumulants (developed originally by Grassi, Hirayama and Ollitrault) in a scenario where the oversampling procedure is employed and proceed to compute it in several collision energies.

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