## Cumulants of net-charge distribution and net-proton distribution from iEBE-VISHNU hybrid model

## **Summary**

Non-Gaussian moments and their products of fluctuations of conserved quantities, e.g. net charges and net baryons, are proposed to be sensitive observables for probing the signature of Quantum Chromodynamic phase transition and locating the critical point. In this article, we investigate the the centrality dependence of cumulants/cumulants products of net–charge and net-proton distributions for Au+Au collisions at  $\sqrt{s_{NN}} = 7.7$ , 39 and 200 GeV by using the iEBE-VISHNU hybrid model. The effects of volume corrections (volume distributions and volume fluctuations), hydrodynamics evolution, resonance/weak decays,

as well as realistic acceptance cuts for both reference particles and fluctuation measures have been embodied in the iEBE-VISHNU hybrid model. With Poisson approximation for the products particles at the Cooper-Frye hypersurface and some realistic acceptance cuts for the final particles of interest, the iEBE-VISHNU model show resonable descriptions for net-charge and net-proton data reported by the STAR collaboration.

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