

Abstract Submitted
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The shapes of the multiplicity distributions in $\sqrt{s_{\text{NN}}}=7.7\text{--}200$ GeV Au+Au Collisions at STAR¹ DANIEL MCDONALD, Rice University, STAR COLLABORATION — A possible signature of the existence of a critical point in the phase diagram of nuclear matter is the non-monotonic behavior of the shape of the multiplicity distributions of particles reflecting the conserved quantities of baryon number, charge, or strangeness. These shapes are characterized with respect to Gaussian distributions via the variance and higher statistical moments, which may reflect the critical fluctuations that may diverge at beam energies near the critical point. The STAR experiment has measured Au+Au collisions at a wide range of beam energies, $\sqrt{s_{\text{NN}}}=7.7\text{--}200$ GeV, and is well suited for numerous measurements because of its wide, uniform acceptance and the extended particle identification from a newly-installed Time-of-Flight (TOF) system. The measurements of the shapes of the multiplicity distributions of net protons, net kaons, and net charge - via the statistical moments skewness, kurtosis, and the intensive normalized cumulants of Ref. [1] - will be described.

[1] C. Athanasiou *et al.*, Phys. Rev. D 82, 074008 (2010).

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