

Proton number fluctuations due to mundane effects

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A quick overview: net-proton number fluctuations

- baryon number susceptibilities χ_i^B may indicate critical point
- they can be measured as cumulants of the net-proton number distribution
- non-critical effects influencing fluctuations
 - only protons measurable
 - baryon number conservation
 - limited acceptance and efficiency

In this work:

- baryon number conservation
- protons (seen), neutrons (not seen), and their antiparticles
- limited acceptance
- **rapidity distribution of wounded nucleons and produced $N\bar{N}$ pairs**

We look at the dependence of cumulants on:

- width of the acceptance rapidity window at midrapidity
- position of the acceptance window in rapidity
- collision energy
- centrality

Rapidity distributions of wounded and produced nucleons

Wounded nucleons

Number determined by MC Glauber

Tuned to data on $p - \bar{p}$

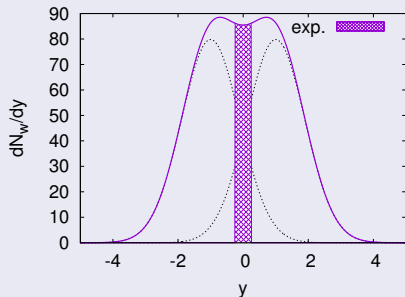


Illustration for: $y_m = 1$, $dy = 0.8$

Produced $N\bar{N}$ pairs

Mean number $\propto N_w$

Tuned to data on number of \bar{p}

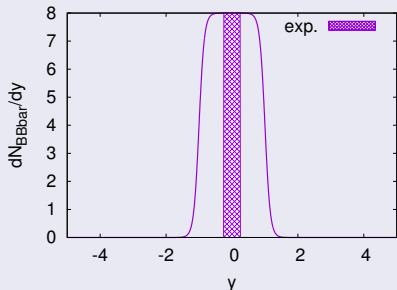
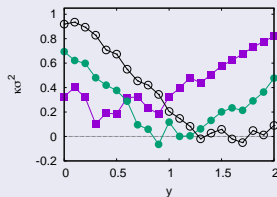
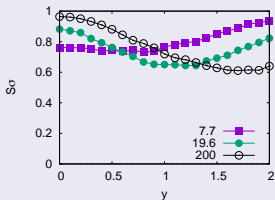


Illustration for: $y_m = 1$, $a = 0.08$

Parameters tuned for each of the RHIC BES energies.

Some results

Rapidity dependence of skewness and kurtosis



Collision energy dependence of skewness and kurtosis

