Quark Matter 2008, Feb. 4-10, 2008 - Jaipur - India
“oral” presentation

H. H. Dalsgaard[a]

[a]Niels Bohr Institute, University of Copenhagen,
Copenhagen Ø, 2100 , Denmark, *hans.dalsgaard@cern.ch*
For the BRAHMS Collaboration

Stopping and limiting fragmentation from RHIC to LHC

Stopping in heavy ion collisions has been measured by several experiments at different collision energies, in particular the AGS [1],SPS [2] and RHIC [3]. In this talk proton dN/dy distributions measured by the BRAHMS experiment in $\sqrt{s_{NN}} = 62.4$ GeV Au+Au collisions at RHIC will be presented.
To quantify stopping the average rapidity loss is often used. It is defined as [4]:

$$\delta y = y_{beam} - \frac{2}{N_{part}} \int_0^{y_{beam}} y \frac{dN_{B-\bar{B}(y)}}{dy} dy \tag{1}$$

Here y_{beam} is the beam rapidity, N_{part} is the number of participating baryons. $\frac{dN_{B-\bar{B}(y)}}{dy}$ is the net-baryon rapidity density which must be derived from the measured net-proton distribution. In this talk measurements from the BRAHMS experiment for $\sqrt{s_{NN}} = 62.4$ GeV Au+Au collisions will be presented. The calculation of the rapidity loss will be presented and the result compared to measurements at AGS, SPS and RHIC. This comparison will be used to predict the rapidity loss of central Pb+Pb collisions at the Large Hadron Collider at CERN which will begin operation in the spring of 2008. A simple model will be used to obtain the net-baryon distribution at LHC and predict the energy loss available for particle production. From this an estimate will be given of the charged particle multiplicity at LHC. It has been conjectured that protons violate the energy dependence of limited fragmentation [5]. In the talk this question will be addressed using the 62.4 GeV data and a correction for the different setups of experiments at different energies.

References

[1] Back, B. B. *et al.*, E917 Collaboration, Phys. Rev. Lett., **86**, 1970 (2001).

[2] H. Appelhauser *et al.*, NA49 Collaboration, Phys. Rev. Lett. **82**, 2471 (1999).

[3] Bearden, I. G. *et al.*, BRAHMS Collaboration, Phys. Rev. Lett., **93**, 102301 (2004).

[4] Videbaek, F. and Hansen, O., Phys. Rev., **C52**, 1995, 2684.

[5] Adams, J. *et al.*, STAR Collaboration, Phys. Rev. C, **73**, 034906 (2006).