Rapidity dependence of net baryon densities and transverse flow at RHIC

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The BRAHMS collaboration has studied net proton ($p - \bar{p}$) density over a broad range in rapidity for Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV. We will present proton and anti–proton transverse mass distributions and yields at selected rapidities from midrapidity ($y \approx 0$) to forward rapidities ($y \geq 2.5$). The net proton distribution contains information on both the dynamics of the heavy ion reaction (degree of stopping) and the energy density achieved. We find that the net proton yield at midrapidity is lower than at $\sqrt{s_{NN}} = 130$ GeV, indicating that at $\sqrt{s_{NN}} = 200$ GeV a higher degree of transparency has been achieved.

The BRAHMS experiment at RHIC consist of 2 magnetic spectrometers and detectors measuring the global properties of the collision. BRAHMS has, among the RHIC experiments, the unique ability to identify particles over a large range of rapidities ($0 \leq y \leq 3.5$) and transverse momenta ($p_t \leq 4GeV/c$). RHIC has in 2001 reached full Au+Au energy ($\sqrt{s_{NN}} = 200GeV$) and it is the data from these runs that will be presented.

In the talk the systematics of charged particle spectra ($\pi^{\pm}, K^{\pm}, p^{\pm}$), in the range y=0–2.5, leading to an analysis of the rapidity dependence of transverse flow will also be discussed.

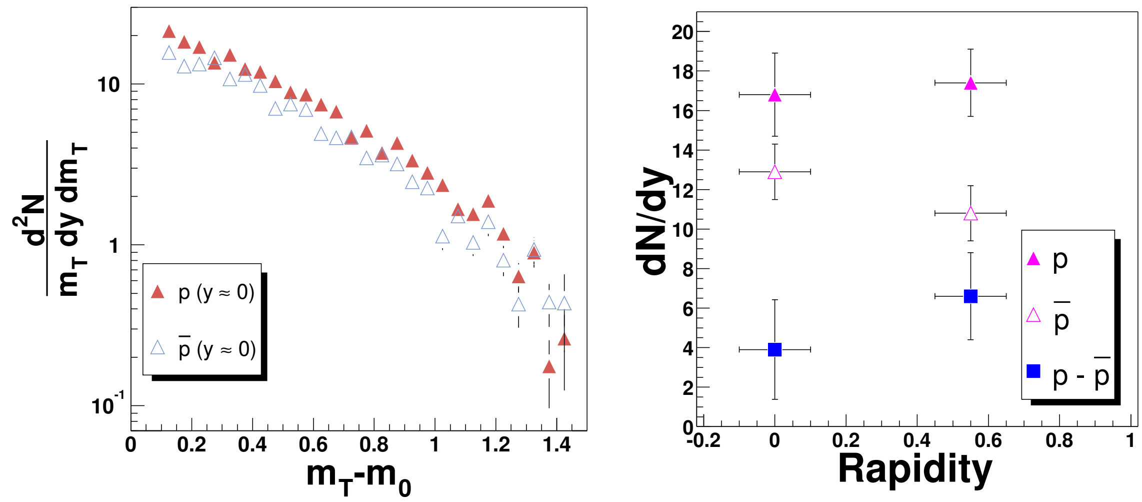

Figure 1: Sample of BRAHMS preliminary results near midrapidity for the top 25 % central data. The proton and anti–proton distributions are not corrected for feed-down.