Hadronic Spectra from Centrality Selected Pb – Pb Collisions at 158 GeV/nucleon

Glenn Cooper, Peter Jacobs, and the NA49 Collaboration

The proton and negative hadron spectra from centrality selected Pb – Pb collisions at 158 GeV/nucleon have been measured by the NA49 experiment at the CERN SPS. Centrality is determined by measuring the energy of the non-interacting portion of the projectile. The spectra shown here were measured in the NA49 TPC's and have been corrected for detector acceptance and efficiency, but have not yet been corrected for backgrounds, which are on the order of 10 percent or less. The data are divided into six centrality bins and the most central bin corresponds to the NA49 central data.[1]

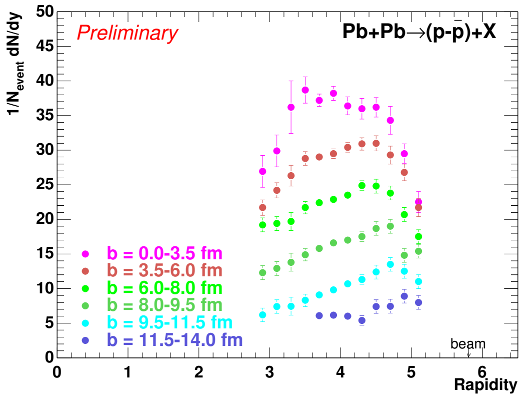

Figure 1: Net proton $(p - \overline{p})$ rapidity distributions for central (top) to peripheral (botton) collisions.

Protons were identified by measuring the ionization deposited by the track in the Main TPC's. Figure 1 shows the net proton $(p - \overline{p})$ rapidity distribution in the six centrality bins. The data show the increase in the number of participating nucleons and the increase in baryon stopping in going from peripheral to central collisions. The inverse slope of the transverse momentum spectra at mid-rapidity increases from peripheral to mid-central (about b = 7fm) collisions and then remains constant to central collisions.

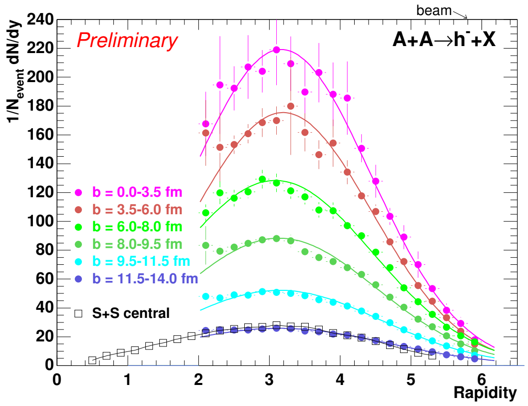

Figure 2: Negative hadron rapidity distributions for central (top) to peripheral (bottom) collisions.

Figure 2 shows the negative hadron rapidity distribution in the six centrality bins. The width of this distribution is nearly constant over the full range in centrality. Also shown is the negative hadron rapidity distribution measured in S – S collisions at 200 GeV/nucleon by the NA35 collaboration.[2] The total yield of negative hadrons is proportional to the number of participating nucleons, which was determined from the measurement of projectile spectator energy.

References

[1] M. Toy et. al., this report; H. Appelshäuser, to be published in PRL

[2] T. Alber et. al., Eur. Phys. J. C**2** (1998) 643.