

Proton and Negative Hadron Spectra from NA49

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The proton and negative hadron spectra from central Pb-Pb collisions at 158 GeV/nucleon have been measured by the NA49 experiment at the CERN SPS. These two distributions show two facets of the collision process: the rapidity shift (and thus energy loss) of the beam nucleons, which are represented by the protons, and the subsequent production of particles. The data shown here were taken by the NA49 Main TPCs and are fully corrected for acceptance, tracking efficiency, and non-target vertex track backgrounds.

Figure 1 shows the proton distribution in rapidity determined by the ‘plus-minus-minus’ method. The transverse momentum inverse slope parameter at mid-rapidity is 291 ± 22 GeV. This technique uses the fact that charge and baryon number are conserved to form the basis of the net proton yield on the charge difference of all detected particles. Corrections are then made for the residual non-proton content composed of K^+K^- from associated production, $\pi^+\pi^-$ from the isospin carried by the participating neutrons, and decay products from Λ baryons that are misidentified as coming from the target vertex. The VENUS¹ model was used to generate the particle distributions used for these corrections. Preliminary strange particle yields from NA49 agree with the predictions from VENUS.

Also shown are data from central S-S collisions at 200 GeV/nucleon by the NA35 experiment². The data are scaled for the difference in beam energy and number of participating nucleons. The Pb results show a flatter spread in rapidity which suggest a greater rapidity loss than the S data.

Because the beam projectile and target are composed of only nucleons, the negatively charged particles from the collision are a mea-

sure of the particle production. Figure 2 shows the negative hadron rapidity spectrum that is the sum of the π^- , K^- , and \bar{p} yields. The scaled NA35 S-S data shows good agreement with the Pb-Pb data and indicates that multiparticle production scales simply with the number of participating nucleons.

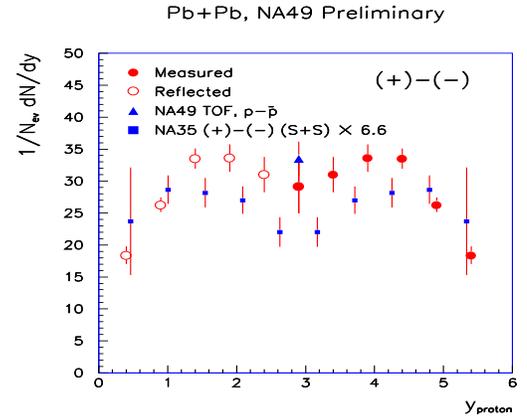


Figure 1: Rapidity distribution of protons

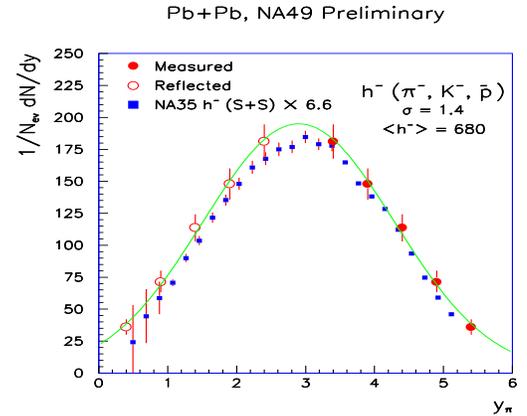


Figure 2: Rapidity distribution of h^-

Footnotes and References

¹K. Werner, Phys Rep 232 (1993) 87

²J. Baechler et. al., Phys. Rev. Lett. 72 (1994) 1419