

First Measurements of Antikaons in Proton-Nucleus Collisions at SIS Energies^{B,G}

W. Scheinast¹, I. Böttcher⁴, M. Dębowski¹, F. Dohrmann¹, A. Förster³, E. Grosse¹, B. Kamys⁶,
P. Koczoń², B. Kohlmeier⁴, F. Laue², M. Menzel⁴, L. Naumann¹, H. Oeschler³, F. Pühlhofer⁴,
Ch. Schneider¹, E. Schwab², P. Senger², Y. Shin⁵, H. Ströbele⁵, Ch. Sturm³, G. Surówka⁶, F. Uhlig³,
A. Wagner¹, W. Walus⁶ ¹FZ Rossendorf, ²GSI, ³TU Darmstadt ⁴Univ. Marburg, ⁵Univ. Frankfurt, ⁶Univ. Cracow

The first systematic experimental investigation of K^- production in proton-nucleus collisions at SIS energies has been performed using the Kaon Spectrometer at SIS/GSI. Au and C targets were bombarded with proton beams at energies of 1.6, 2.5, and 3.5 GeV. K mesons and pions were measured at laboratory angles of 32°, 40°, 48°, and 56°. In total, 350000 K^+ and 35000 K^- have been recorded. Fig. 1 shows the inclusive invariant production cross sections for K^+ (open symbols) and K^- (full symbols) as function of transverse mass (minus rest mass).

The spectra measured at different angles can be described by a Boltzmann distribution with a normalization factor, a temperature, and a longitudinal source velocity as free parameters. By integrating the Boltzmann distribution we estimate the total production cross sections σ_K . The resulting multiplicity $M_K = \sigma_K/\sigma_R$ with σ_R the geometrical reaction cross section is shown in fig. 2.

A detailed comparison of the data to results of transport model calculations is in progress.

Fig. 1 Inclusive invariant production cross sections for K^+ (open symbols) and K^- (full symbols) measured in proton-nucleus collisions (preliminary).

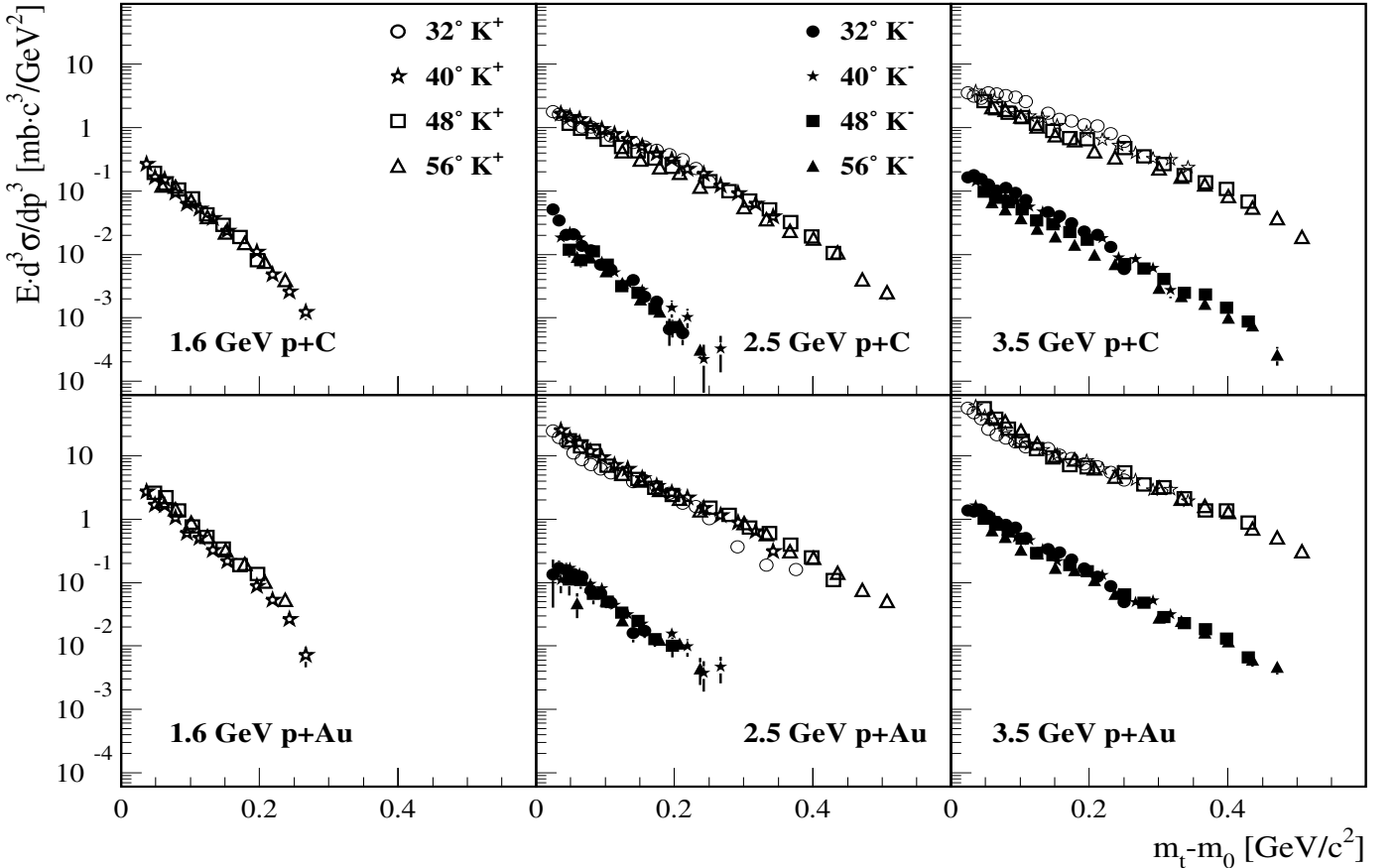


Fig. 2 Multiplicity of K^+ and K^- mesons in $p+C$ and $p+Au$ collisions as function of beam energy (preliminary).

