

# Production of charged pions off nuclei with $3 \cdots 30$ GeV incident protons and pions\*

K. Gallmeister<sup>†</sup> and U. Mosel  
*Institut für Theoretische Physik, Universität Giessen, Germany*

This is the addendum called “The Gallery” [12] to the paper arXiv:0901.1770 [hep-ex].

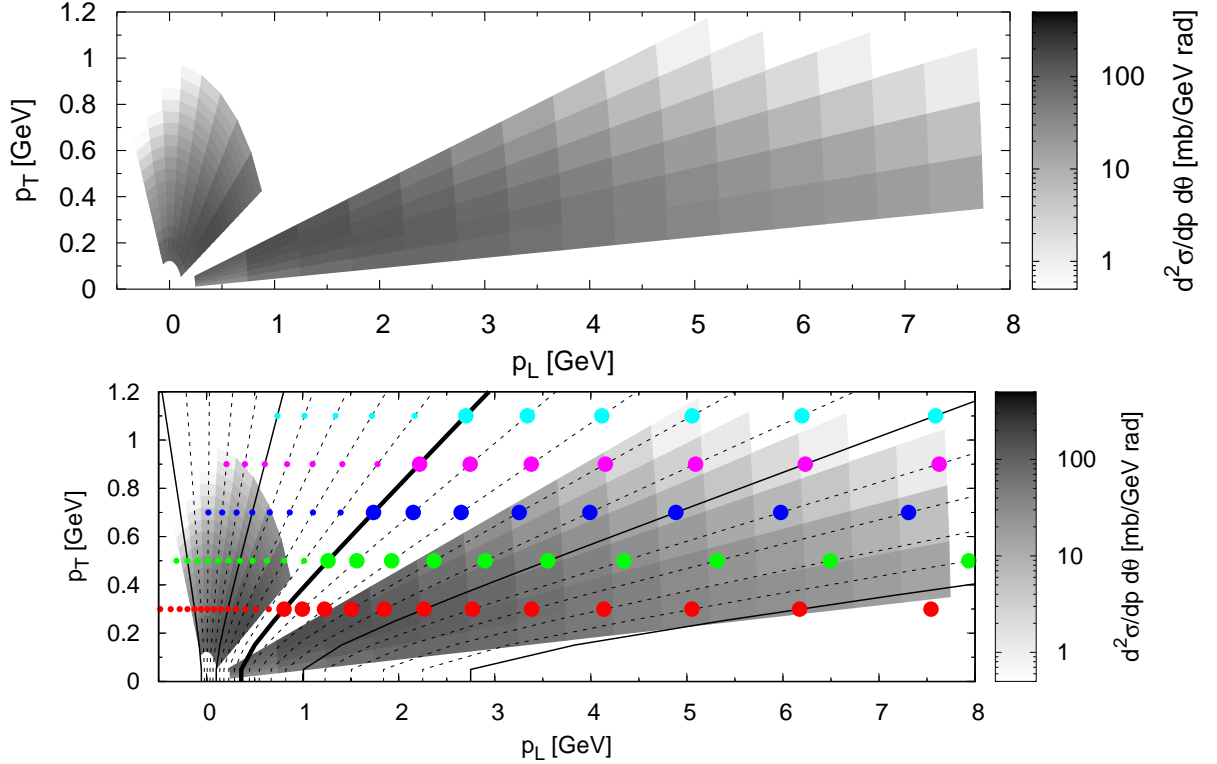


FIG. 1: The coverage of the HARP (small/large angle) analysis, transformed from momentum and angle ( $p, \theta$ ) to longitudinal and transversal momenta ( $p_L, p_T$ ). Color encoded are calculated results for the cross section  $p + Be \rightarrow \pi^+ + X$  at 12 GeV. In the lower panel we indicate the positions of the  $pp$  data points [13] and lines of constant  $y^*$ .

\* Work supported by DFG.

<sup>†</sup>Electronic address: Kai.Gallmeister@theo.physik.uni-giessen.de

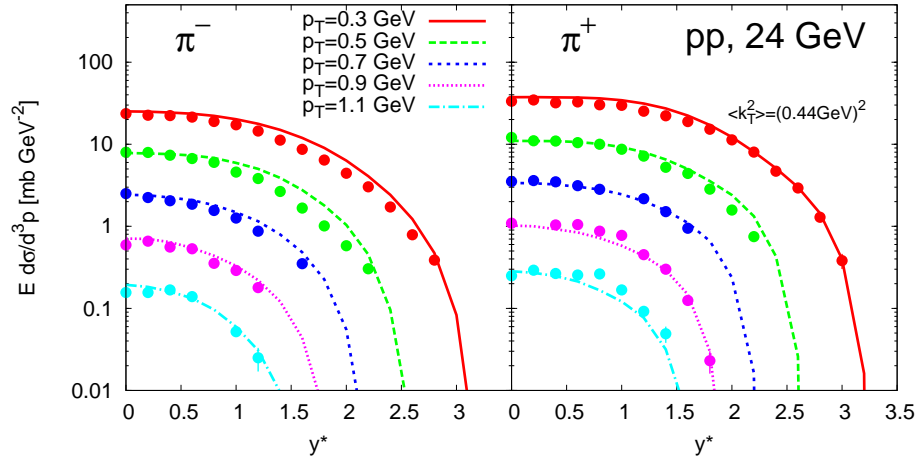


FIG. 2: Invariant cross section  $E d\sigma/d^3p$  for  $pp \rightarrow \pi^\pm X$  with 24 GeV beam momentum. Experimental data are from [13]. Due to symmetry only  $y^* > 0$  is shown.

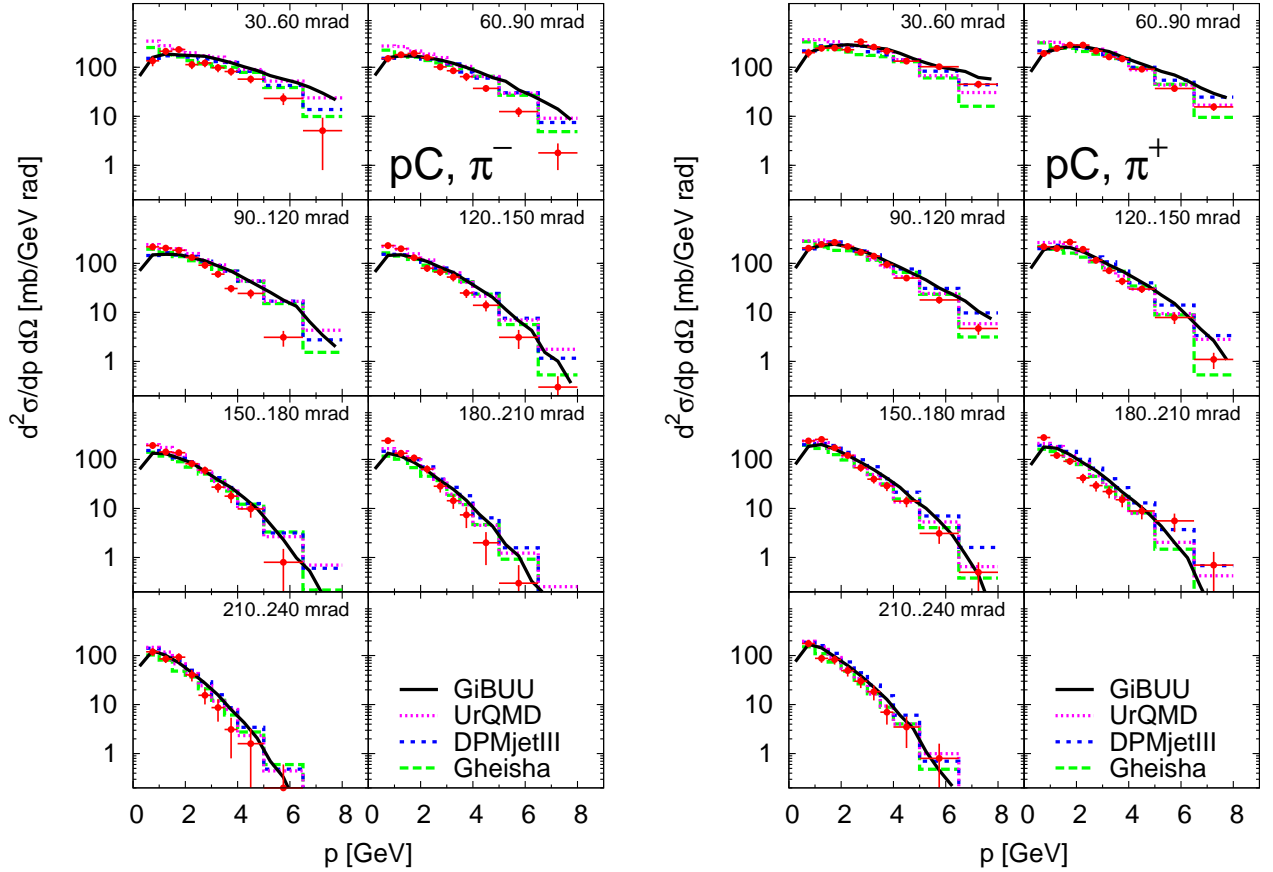


FIG. 3: The comparison with the theoretical model predictions for  $p + C \rightarrow \pi^\pm + X$  at 12 GeV.

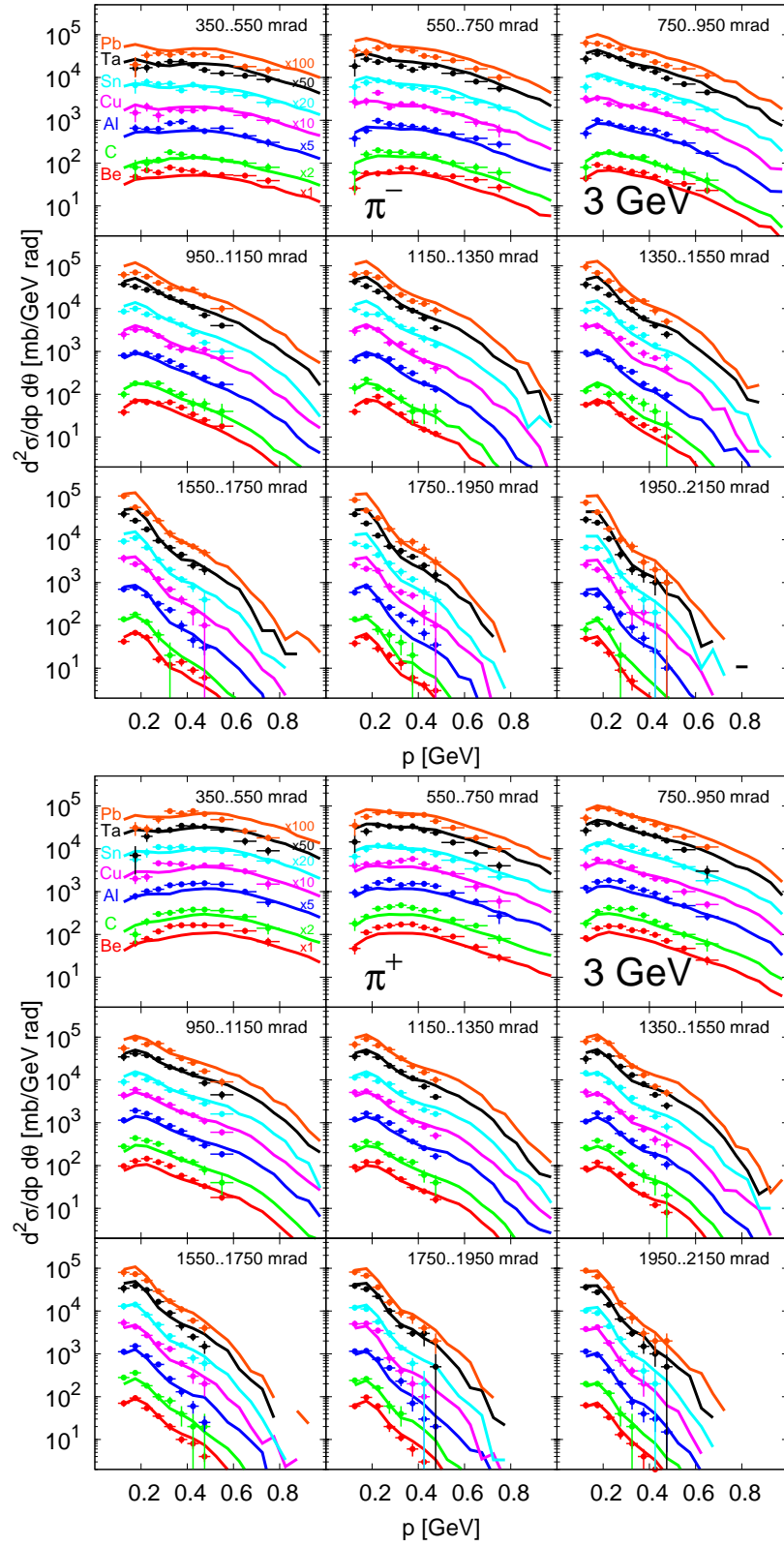


FIG. 4: Cross section  $d^2\sigma/dp d\theta$  for  $p + A \rightarrow \pi^\pm + X$  with 3 GeV beam momentum. Experimental data are from [2] (HARP large angle analysis), curves and data scaled as indicated.

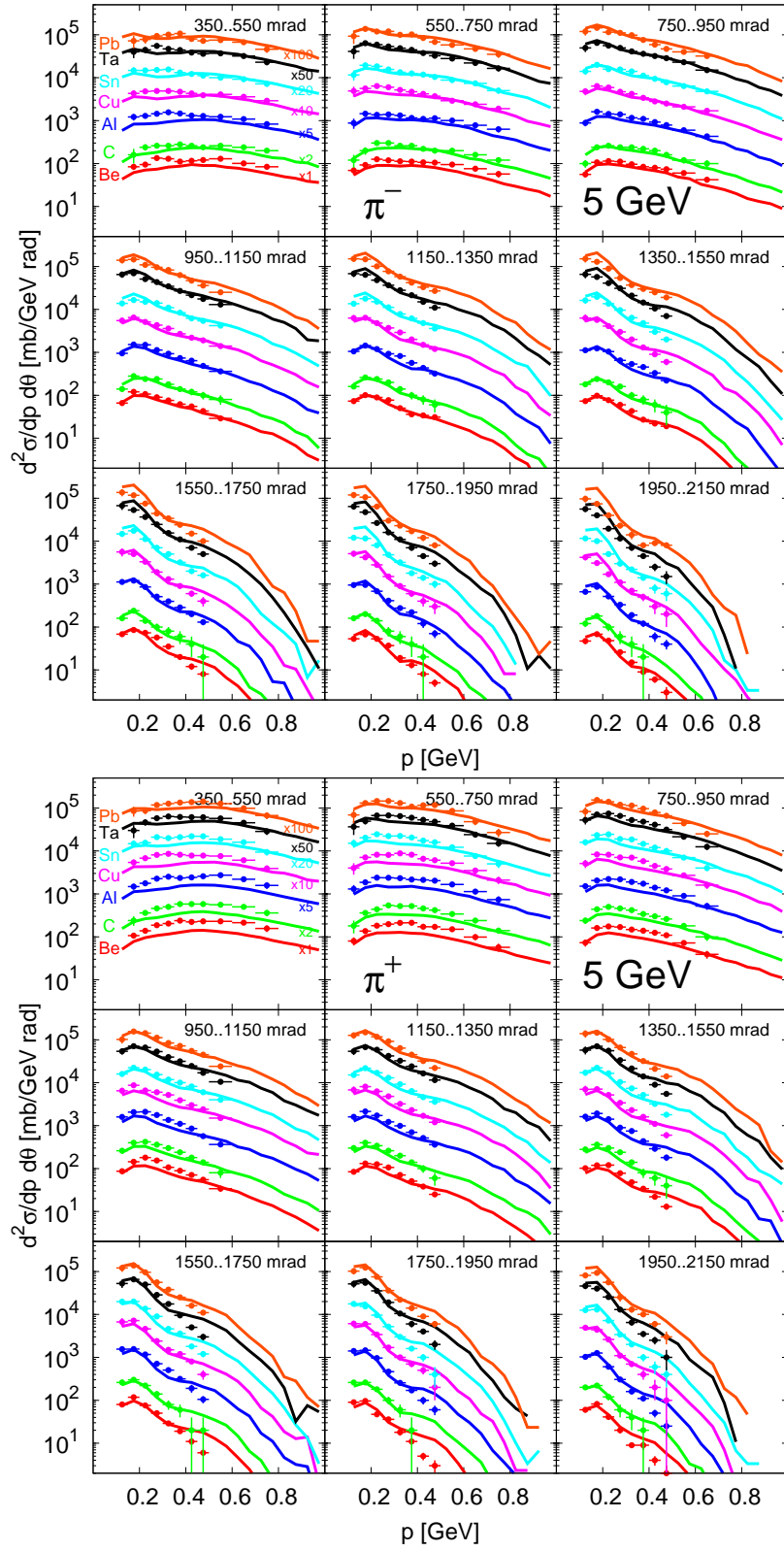


FIG. 5: Cross section  $d^2\sigma/dp d\theta$  for  $p + A \rightarrow \pi^\pm + X$  with 5 GeV beam momentum. Experimental data are from [2] (HARP large angle analysis), curves and data scaled as indicated.

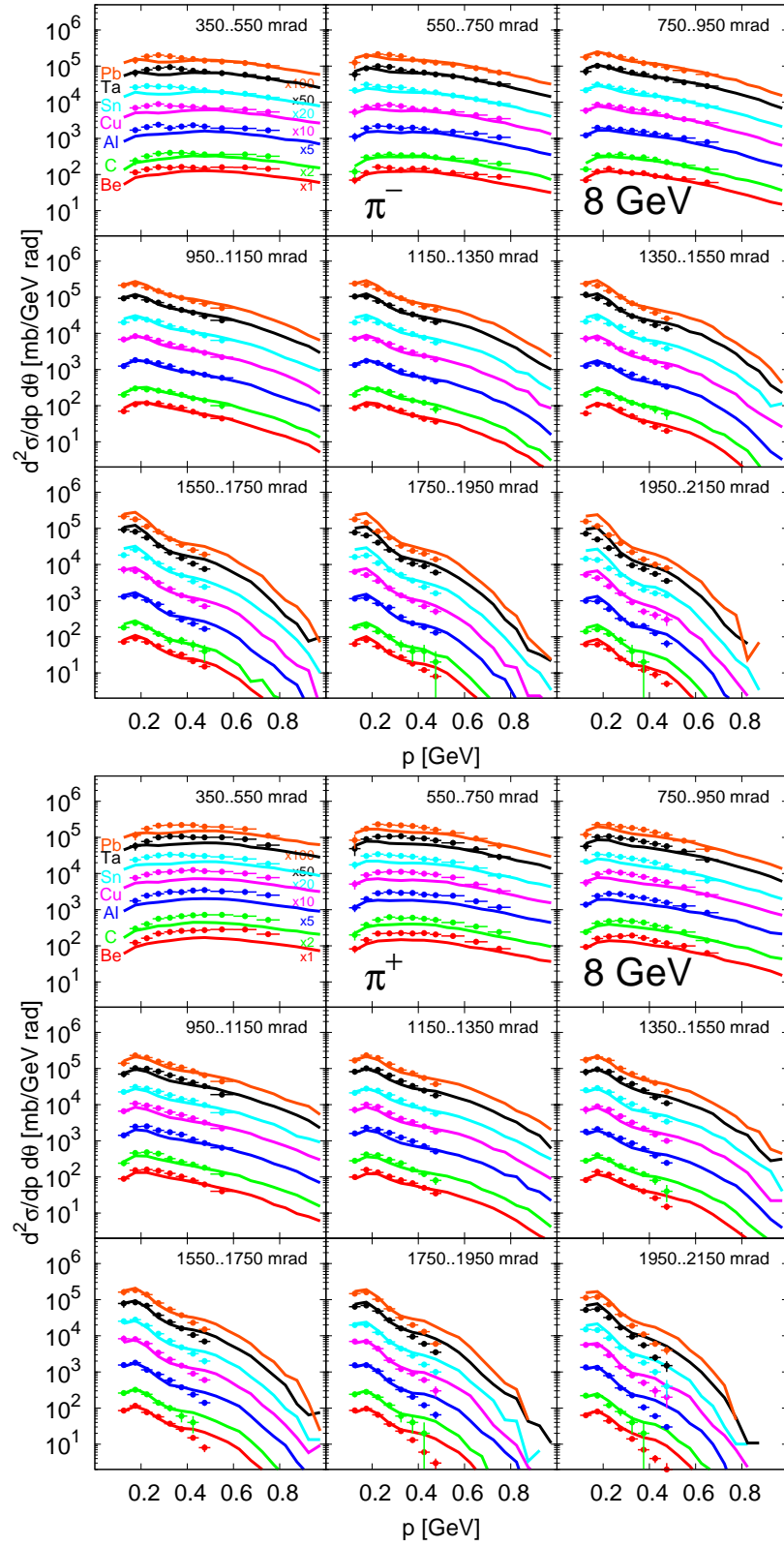


FIG. 6: Cross section  $d^2\sigma/dp d\theta$  for  $p + A \rightarrow \pi^\pm + X$  with 8 GeV beam momentum. Experimental data are from [2] (HARP large angle analysis), curves and data scaled as indicated.

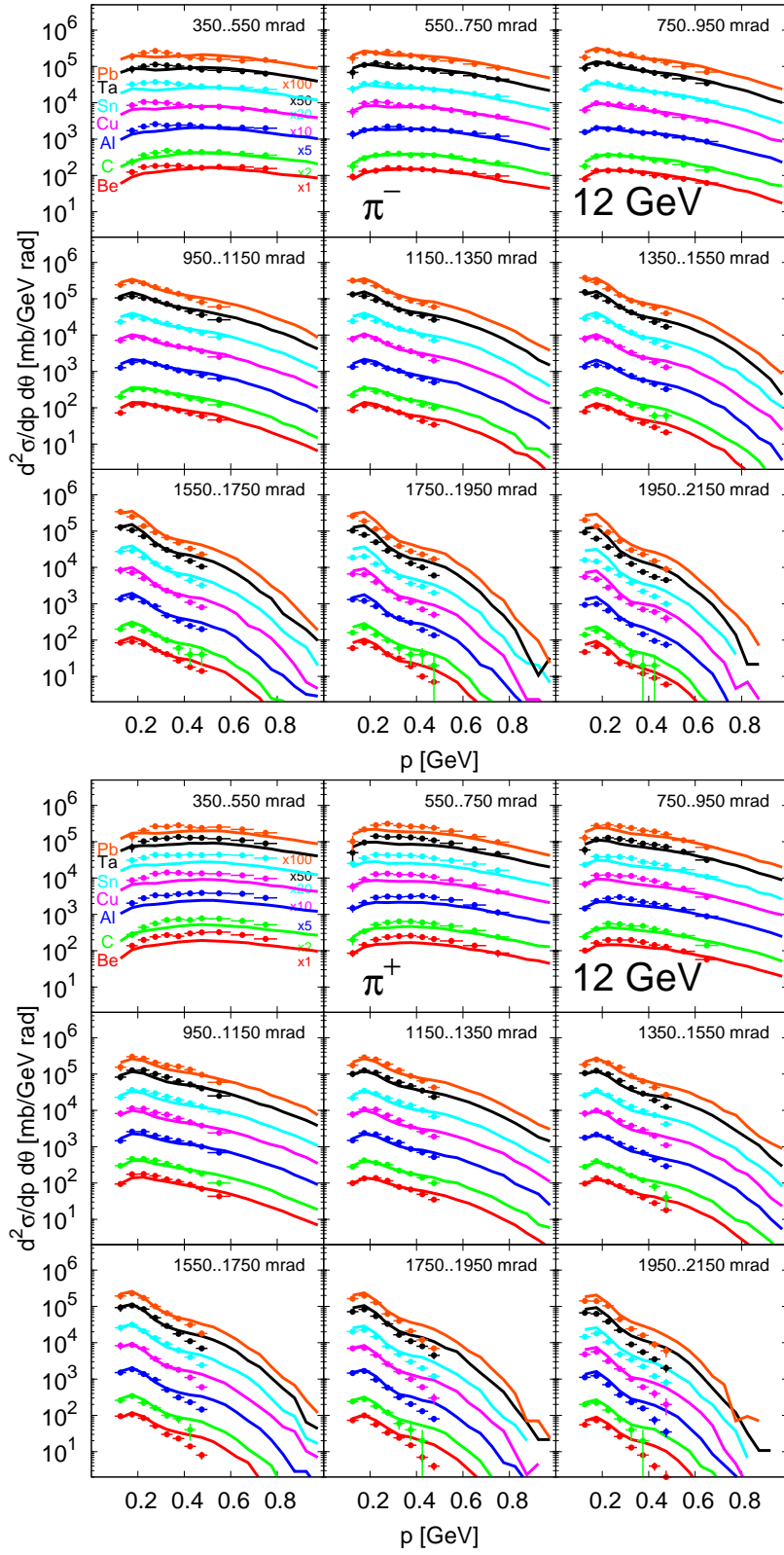


FIG. 7: Cross section  $d^2\sigma/dp d\theta$  for  $p + A \rightarrow \pi^\pm + X$  with 12 GeV beam momentum. Experimental data are from [2] (HARP large angle analysis), curves and data scaled as indicated.

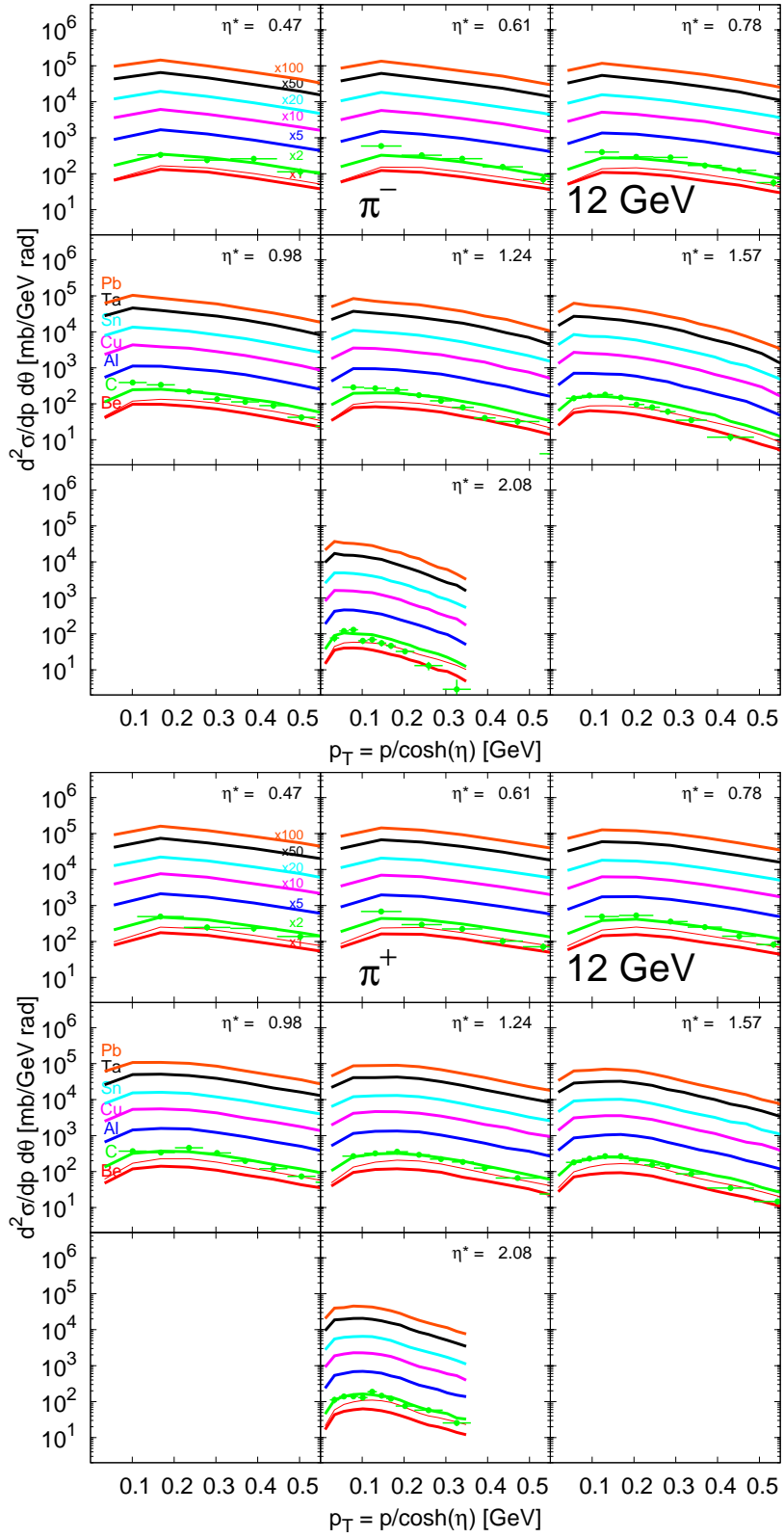


FIG. 8: Cross section  $d^2\sigma/dp d\theta$  for  $p + A \rightarrow \pi^\pm + X$  with 12 GeV beam momentum. As fig. ??, But here we transformed the independent variables to pseudo-rapidity  $\eta^*$  and transverse momentum  $p_T$ . The thin lines at the bottom indicate results for D target, scaled by 4.5. The figure style is chosen as for the large angle analysis.

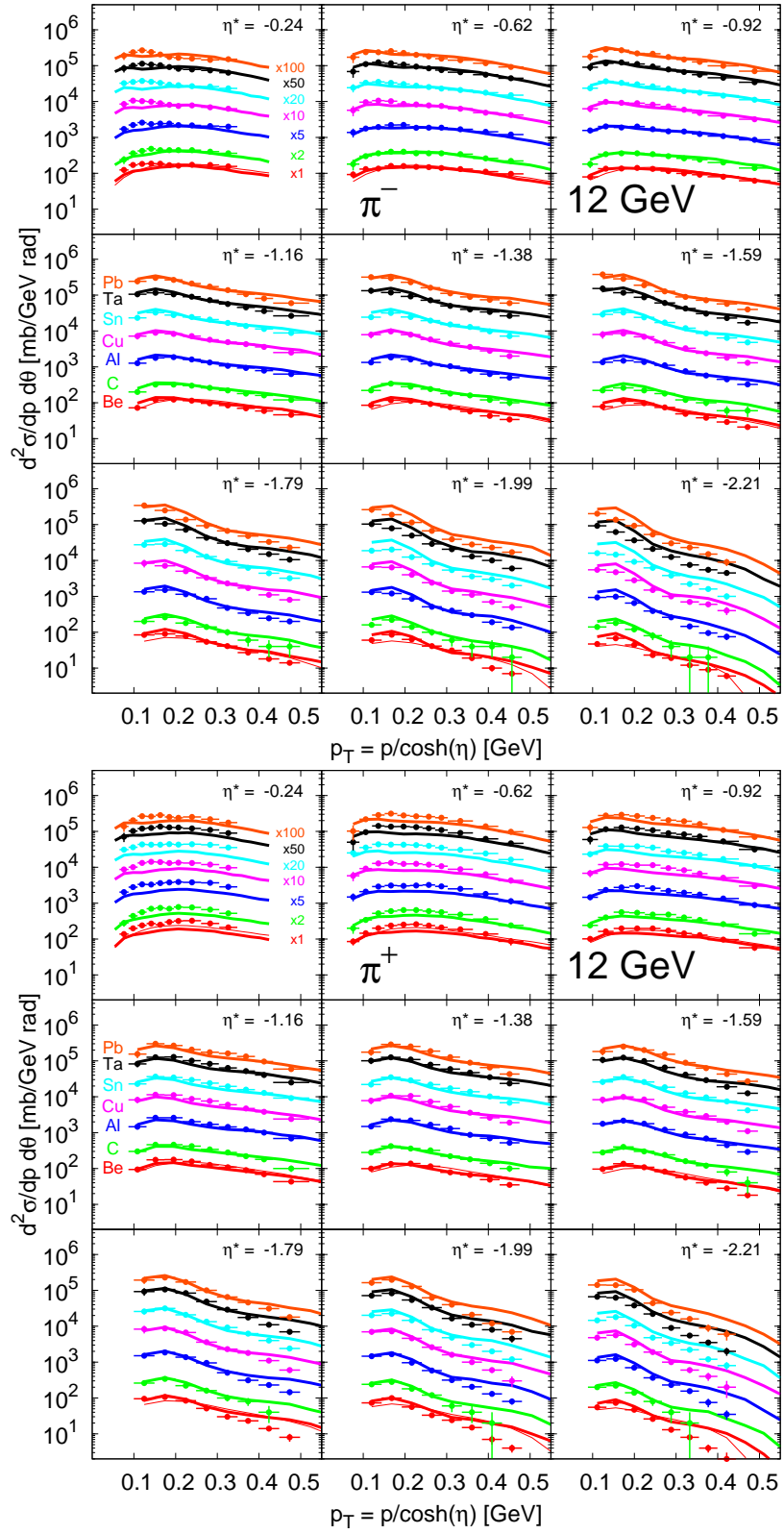


FIG. 9: Cross section  $d^2\sigma/dp d\theta$  for  $p + A \rightarrow \pi^\pm + X$  with 12 GeV beam momentum, as in fig. 7. But here we transformed the independent variables to pseudo-rapidity  $\eta^*$  and transverse momentum  $p_T$ . The thin lines at the bottom indicate results for D target, scaled by 4.5.



- 
- [1] M. G. Catanesi *et al.* [HARP Collaboration], *Astropart. Phys.* **29**, 257 (2008).
  - [2] M. G. Catanesi *et al.* [HARP Collaboration], *Phys. Rev. C* **77**, 055207 (2008).
  - [3] M. G. Catanesi *et al.* [HARP Collaboration], *Nucl. Phys.* **B732**, 1 (2006).
  - [4] <http://theorie.physik.uni-giessen.de/GiBUU>
  - [5] O. Buss, L. Alvarez-Ruso, A. B. Larionov and U. Mosel, *Phys. Rev.* **C74**, 044610 (2006).
  - [6] O. Buss, L. Alvarez-Ruso, P. Mühlich and U. Mosel, *Eur. Phys. J.* **A29**, 189 (2006).
  - [7] T. Falter, W. Cassing, K. Gallmeister and U. Mosel, *Phys. Rev.* **C70**, 054609 (2004).
  - [8] T. Leitner, L. Alvarez-Ruso and U. Mosel, *Phys. Rev. C* **73**, 065502 (2006).
  - [9] T. Leitner, O. Buss, U. Mosel and L. Alvarez-Ruso, arXiv:0809.3986. To appear in the proceedings of 10th International Workshop on Neutrino Factories, Superbeams and Betabeams: Nufact08, Valencia, Spain, 30 Jun - 5 Jul 2008.
  - [10] K. Gallmeister and T. Falter, *Phys. Lett.* **B630**, 40 (2005).
  - [11] K. Gallmeister and U. Mosel, *Nucl. Phys.* **A801**, 68 (2008).
  - [12] <http://gibuu.physik.uni-giessen.de/GiBUU/wiki/HarpGallery>
  - [13] V. Blobel *et al.* [Bonn-Hamburg-Munich Collaboration], *Nucl. Phys.* **B69**, 454 (1974).
  - [14] I. Chemakin *et al.*, *Phys. Rev. C* **65**, 024904 (2002).
  - [15] N. Antoniou *et al.* [NA49-future Collaboration], CERN-SPSC-2006-034.
  - [16] N. Abgrall *et al.* [NA61 Collaboration], CERN-SPSC-2007-033.
  - [17] K. Gallmeister and U. Mosel, work in progress.