Inspire as source of data

A consideration (if I understand the use-case)

SLAC

Triggered by Dmitri presentation of last week

I took a look at Insipire and how the data are presented

- I discussed about our project with its director

Assuming that:

- we want to minimize FNAL-DB (additional) development
- some experimental/real data are (will be) directly available in FNAL-DB: the ones for which we perform regular G4 validation O(10)
- we want a way to get experimental (published) data, possibly via programmatically API

Let's imagine...

SLAC

I need to get experimental data for paper NIM A821 (2009) 118-192 "Forward production of charged pions with incident pi+- on nuclear targets measured at CERN PS"

Authors provided data in machine readable format: updated to one of usual HEP db's (HEPDATA and then indexed by Inspire)

- If that is not the case, we manually need to extract the data from a plot and put it in FNAL-DB

Instead of asking FNAL-DB to provide directly the data, we can save in FNAL-DB a reference to Inspire record ID

Forward production of charged pions with incident pi+- on nuclear targets measured at the CERN PS

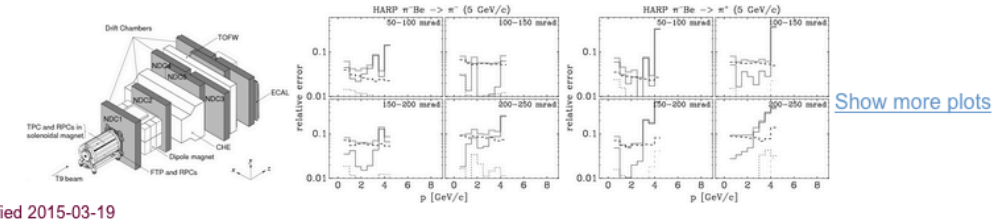
HARP Collaboration (M. Apollonio (INFN, Trieste) *et al.*) Show all 73 authors

Feb 2009 - 80 pages

Nucl.Phys. A821 (2009) 118-192
DOI: 10.1016/j.nuclphysa.2009.01.080
e-Print: arXiv:0902.2105 [hep-ex] | PDF
Experiment: CERN-PS-214

Abstract (arXiv)
Measurements of the double-differential $\pi^{\pm}$ production cross-section in the range of momentum $0.5\GeVc \leq p \leq 8.0\GeVc$ and angle $0.025\rad \leq \theta \leq 0.25\rad$ in interactions of charged pions on beryllium, carbon, aluminium, copper, tin, tantalum and lead are presented. These data represent the first experimental campaign to systematically measure forward pion hadroproduction. The data were taken with the large acceptance HARP detector in the T9 beam line of the CERN PS. Incident particles, impinging on a 5% nuclear interaction length target, were identified by an elaborate system of beam detectors. The tracking and identification of the produced particles was performed using the forward spectrometer of the HARP detector. Results are obtained for the double-differential cross-sections $d^2\sigma/dpd\Omega$ mainly at four incident pion beam momenta (3 \GeVc, 5 \GeVc, 8 \GeVc and 12 \GeVc). The measurements are compared with the GEANT4 and MARS Monte Carlo simulation

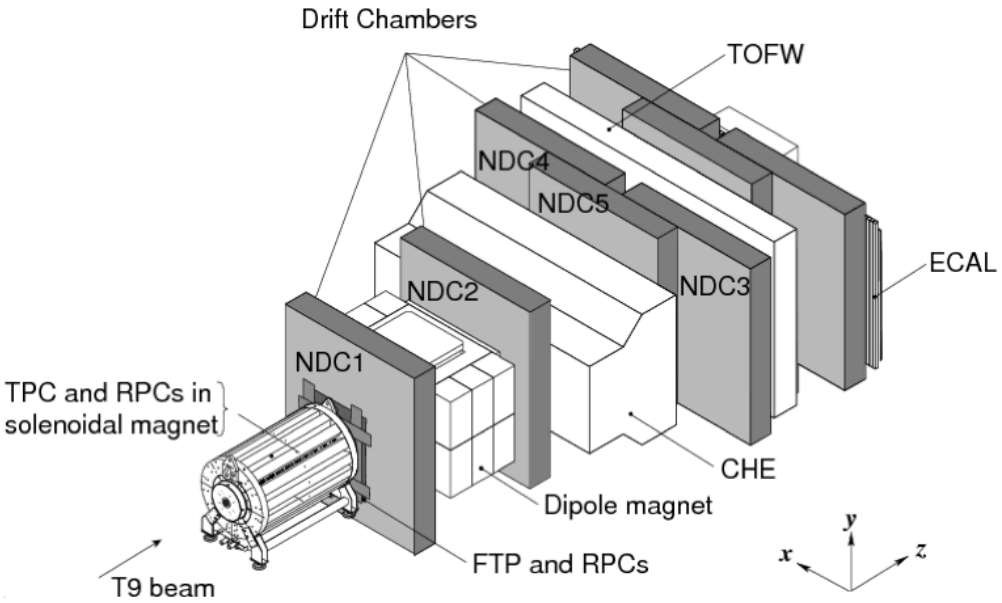
Note: to be published on Nuclear Physics A
Keyword(s): INSPIRE: pi nucleus: inclusive reaction | pi+: hadroproduction | pi-: hadroproduction | small-angle | differential cross section: momentum dependence | angular dependence | mass number: dependence | forward spectrometer | CERN Lab | numerical calculations: Monte Carlo | 3: 5: 8: 12 GeV/c



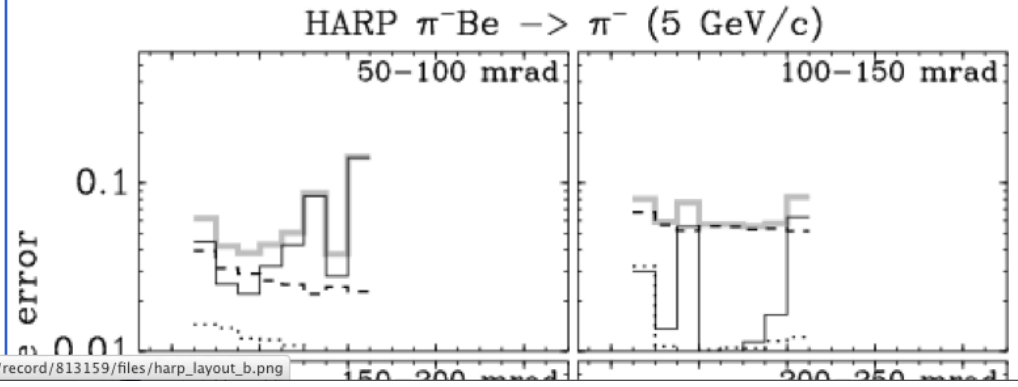
Show more plots

Record added 2009-02-12, last modified 2015-03-19

Forward production of charged pions with incident pi+- on nuclear targets measured at the CERN PS - HARP Collaboration (Apollonio, M. *et al.*)
Nucl.Phys. A821 (2009) 118-192 arXiv:0902.2105 [hep-ex]



Schematic layout of the HARP detector. The convention for the coordinate system is shown in the lower-right corner.



Systematic errors as a function of momentum of the outgoing pions for the particular case of 5 and 8 \GeVc \pim interacting on a beryllium target. Plots in the upper left panel are for incident 5 \GeVc \pim producing \pim, plots in the upper right panel are for 5 \GeVc \pim producing \pip, plots in the lower left panels are for 8 \GeVc \pim producing \pim and plots in the lower right panel are for 8 \GeVc \pim producing \pip. Total

Forward production of charged pions with incident pi+- on nuclear targets measured at the CERN PS - HARP Collaboration (Apollonio, M. *et al.*)
Nucl.Phys. A821 (2009) 118-192 arXiv:0902.2105 [hep-ex]

THIS DATA COMES FROM DURHAM HEPDATA PROJECT

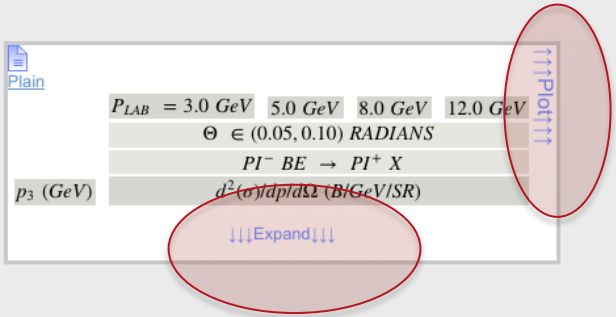
SUMMARY:

CERN-PS. Measurements of the double differential PI+- production cross sections in PI+ and PI- interactions with BE, C, AL, CU, SN, TA and PB nuclei at incident momentum from 3 to 12 GeV/c. The data were taken with the large acceptanceHARP detector in the T9 beam line at the CERN PS with 5 pct nuclear targets and cover the final state PI+- momenta from 0.5 to 8 GeV/c and angle 0.025 to 0.25 radians.. This part (1) contains the data taken with the BE target nucleus.. This part (2) contains the data taken with the C target nucleus.. This part (3) contains the data taken with the AL target nucleus.. This part (4) contains the data taken with the CU target nucleus.. This part (5) contains the data taken with the SN target nucleus.. This part (6) contains the data taken with the TA target nucleus.. This part (7) contains the data taken with the PB target nucleus..

DATASETS:

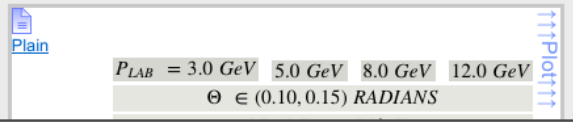
Description: Double differential PI+ and PI- production cross section in the laboratory system for PI- BE interactions at 3, 5, 8 and 12 GeV for the angular range 0.05 to 0.10 radians..

Go to the record



Description: Double differential PI+ and PI- production cross section in the laboratory system for PI- BE interactions at 3, 5, 8 and 12 GeV for the angular range 0.10 to 0.15 radians..

Go to the record



Forward production of charged pi...

inspirehep.net/record/813159/data

Go to the record

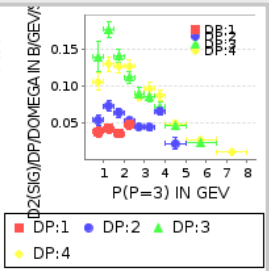
Plain

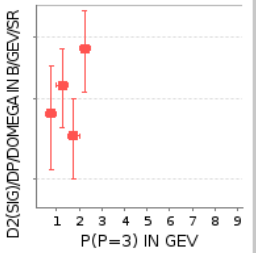
↑↑↑Hide↑↑↑

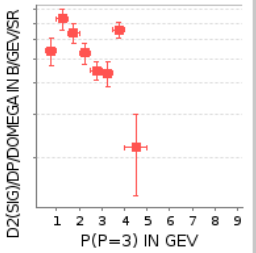
P_{LAB} = 3.0 GeV	5.0 GeV	8.0 GeV	12.0 GeV
$\Theta \in (0.05, 0.10)$ RADIANS			
PI^- BE → PI^+ X			
p_3 (GeV)	$d^2(\sigma)/dp/d\Omega$ (B/GeV/SR)		

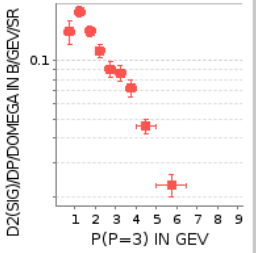
↑↑↑Collapse↑↑↑

0.5– 1.0	0.038 ±0.007	0.054 ±0.007	0.14 ±0.02	0.106 ±0.012
1.0– 1.5	0.042 ±0.006	0.073 ±0.007	0.177 ±0.011	0.13 ±0.01
1.5– 2.0	0.035 ±0.005	0.064 ±0.006	0.141 ±0.009	0.127 ±0.010
2.0– 2.5	0.048 ±0.007	0.053 ±0.005	0.112 ±0.008	0.127 ±0.008
2.5– 3.0	–	0.045 ±0.004	0.090 ±0.008	0.086 ±0.006
3.0– 3.5	–	0.044 ±0.005	0.086 ±0.008	0.097 ±0.008
3.5– 4.0	–	0.066 ±0.005	0.072 ±0.007	0.087 ±0.007
4.0– 5.0	–	0.022 ±0.008	0.046 ±0.004	0.049 ±0.004
5.0– 6.5	–	–	0.023 ±0.003	0.027 ±0.002









Information | Citations (0) | Files

Additional data from: Forward production of charged pions with incident pi+- on nuclear targets measured at the CERN PS

HARP Collaboration (Apollonio, M. (INFN, Trieste) [...]) *Show all 73 authors*

Cite as: HARP Collaboration (2009) HepData, [no persistent identifier assigned]

Description: Double differential PI+ and PI- production cross section in the laboratory system for PI- BE interactions at 3, 5, 8 and 12 GeV for the angular range 0.05 to 0.10 radians..

Plain

P_{LAB} = 3.0 GeV	5.0 GeV	8.0 GeV	12.0 GeV
$\Theta \in (0.05, 0.10)$ RADIANS			
PI^- BE → PI^+ X			
p_3 (GeV)	$d^2(\sigma)/dp/d\Omega$ (B/GeV/SR)		

↓↓↓Plot↓↓↓

↓↓↓Expand↓↓↓

This dataset complements the following publication:
Forward production of charged pions with incident pi+- on nuclear targets measured at the CERN PS

Record added 2012-08-23, last modified 2012-10-24

Export
BibTeX, EndNote, LaTeX(US), LaTeX(EU), Harvmac, MARC, MARCXML, NLM, DC

Path: /HepData/7513/d1-x1-y1
Double differential PI+ and PI- production cross section in the laboratory system for PI- BE interactions at 3, 5, 8 and 12 GeV for the angular range 0.05 to 0.10 radians.
Location: T 4
PLAB : 3.0 GeV : 5.0 GeV : 8.0 GeV : 12.0 GeV
RE : PI- BE --> PI+ X
THETA IN RADIANS : 0.05 TO 0.10
x: P(P=3) IN GEV
y : D2(SIG)/DP/DOMEGA IN B/GEV/SR

x	xlow	xhigh	y	dy+	dy-	y	dy+	dy-	y	dy+	dy-	y	dy+	dy-
0.75	0.5	1.0	0.038	+0.007	-0.007	0.054	+0.007	-0.007	0.14	+0.02	-0.02	0.106	+0.012	-0.012
1.25	1.0	1.5	0.042	+0.006	-0.006	0.073	+0.007	-0.007	0.177	+0.011	-0.011	0.13	+0.01	-0.01
1.75	1.5	2.0	0.035	+0.005	-0.005	0.064	+0.006	-0.006	0.141	+0.009	-0.009	0.127	+0.01	-0.01
2.25	2.0	2.5	0.048	+0.007	-0.007	0.053	+0.005	-0.005	0.112	+0.008	-0.008	0.127	+0.008	-0.008
2.75	2.5	3.0	-	0.045	+0.004	-0.004	0.09	+0.008	-0.008	0.086	+0.006	-0.006		
3.25	3.0	3.5	-	0.044	+0.005	-0.005	0.086	+0.008	-0.008	0.097	+0.008	-0.008		
3.75	3.5	4.0	-	0.066	+0.005	-0.005	0.072	+0.007	-0.007	0.087	+0.007	-0.007		
4.5	4.0	5.0	-	0.022	+0.008	-0.008	0.046	+0.004	-0.004	0.049	+0.004	-0.004		
5.75	5.0	6.5	-	-	0.023	+0.003	-0.003	0.027	+0.002	-0.002				
7.25	6.5	8.0	-	-	-	0.01	+0.001	-0.001						

Inspire and raw-data

SLAC

Whenever available Inspire uses HepData to present machine-readable data tables

- it also generates plots/tables on the fly

Format is decided and handled by HepData, it is my understanding that scripts to produce plots/tables are also available

Inspire has APIs to query its DB

- The traffic we generate could be easily absorbed by current system
- In case note, there is a general interest towards our activities

Possible workflow

SLAC

Store in FNAL-DB references to Inspire record ID

FNAL-DB provides querying mechanism tailored to our needs (following discussions on reaction/material etc): e.g. query by interaction

FNAL-DB returns record ID from Inspire

- Inspire API provide access to machine readable raw-data
- everything should be integrated in a single library/tool that makes the Inspire usage hidden to the user

We do not "reinvent the wheel" and re-use the professional tools developed exactly for this purpose