Spokesperson talks
BRAHMS retro perspective

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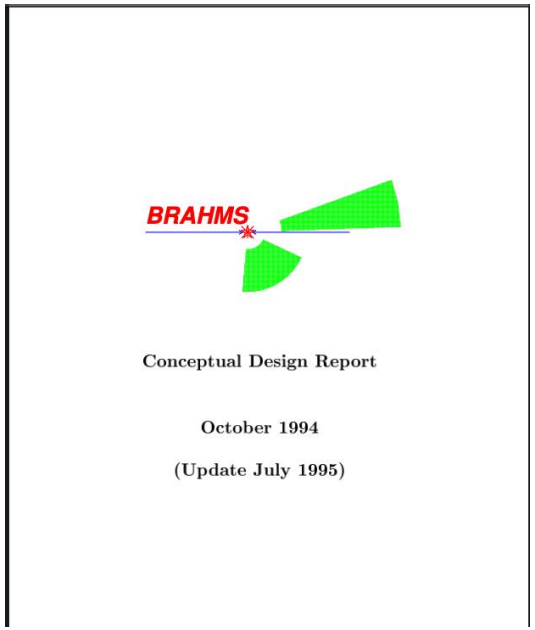
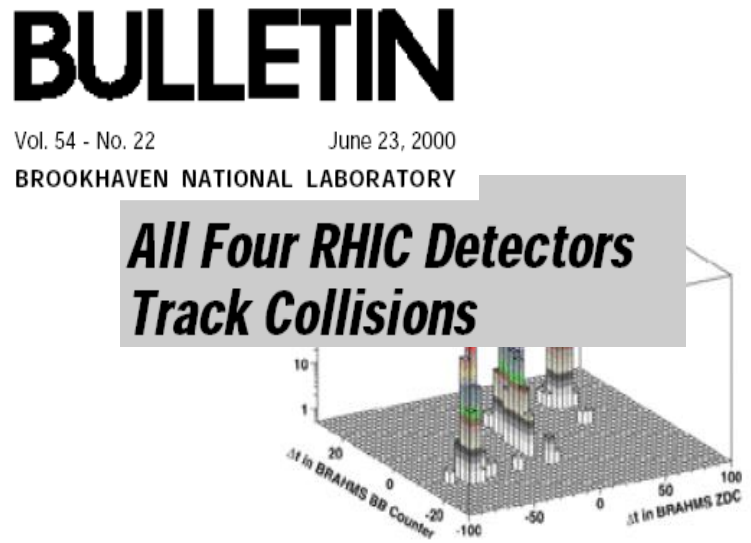
RHIC symposium

Brief History

- Proposed in 1990
- CDR in 1994
- Approved 1995, Funding 1997-2001
- Phased construction due to Funding levels . Forward spectrometer completed for 2001 run with full field.
- RHIC/DOE contribution 5.5M$ Foreign contributions ~ 1.5 M$
- Collaboration- people from AGS, SPS experience



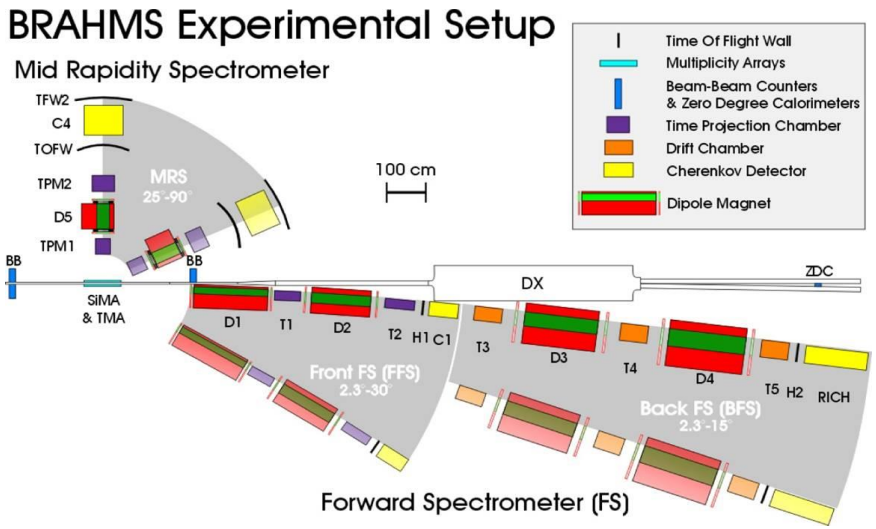


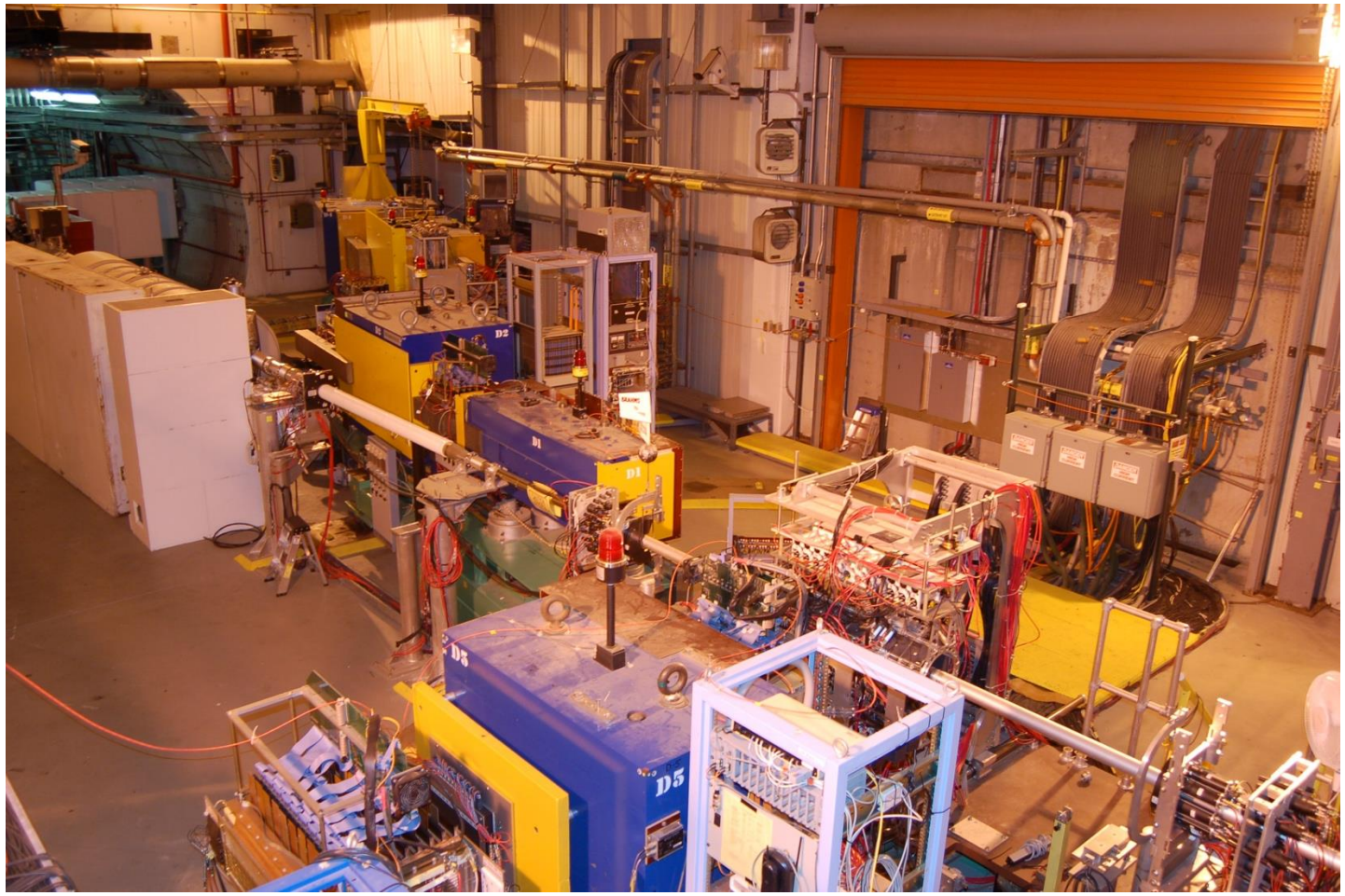
Key measurements methods

- Wide rapidity coverage
- Particle identification
- Charge particle distributions
- Particle production.
- Stopping

BRAHMS was initially posed to be situated at 4 o'clock region
The RF systems made this un -feasible . Swapped to 2 o'clock interaction region

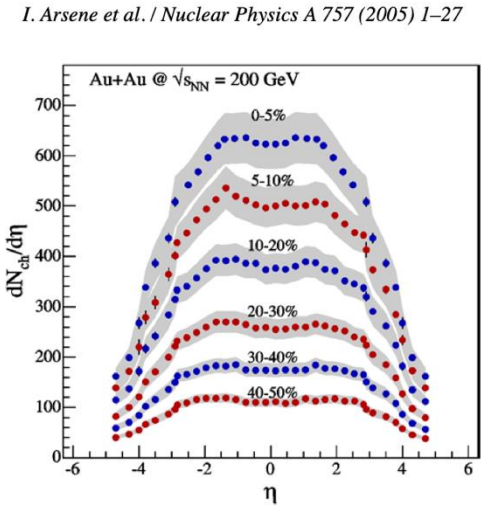
Significant contributions from
NBI- TOF systems, D2 magnet, TPC
Krakow- Drift chambers
IRES Strasbourg TPC

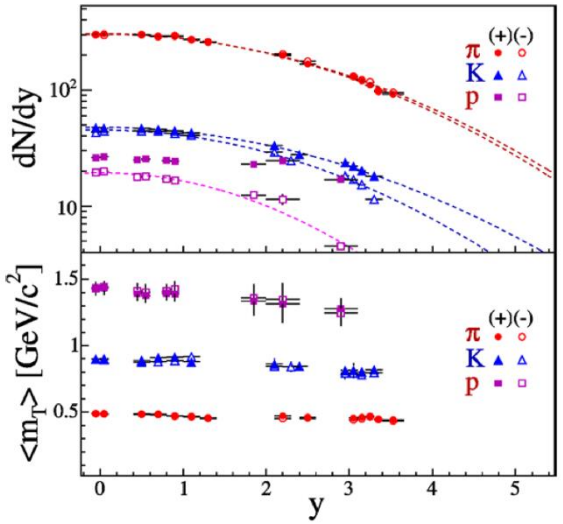


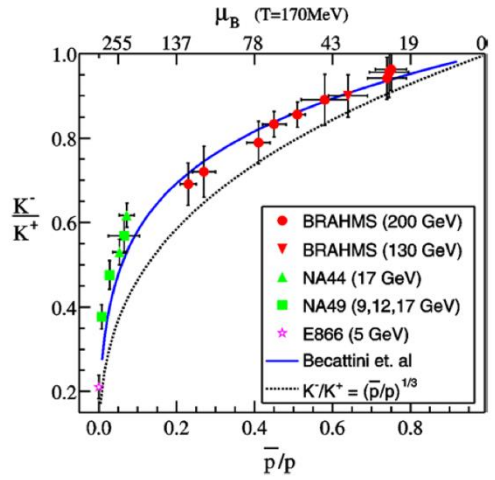


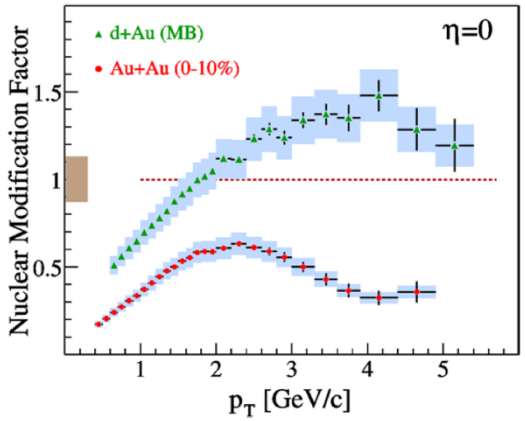
White paper

- The WP process was a very successful endeavor.
- It started with premise that conclusions should be in refereed publication.
- Lead to 4 independent assessments from the experiments and opened at a meeting at Danford.
- Lead to similar conclusion of having found new state of matter.





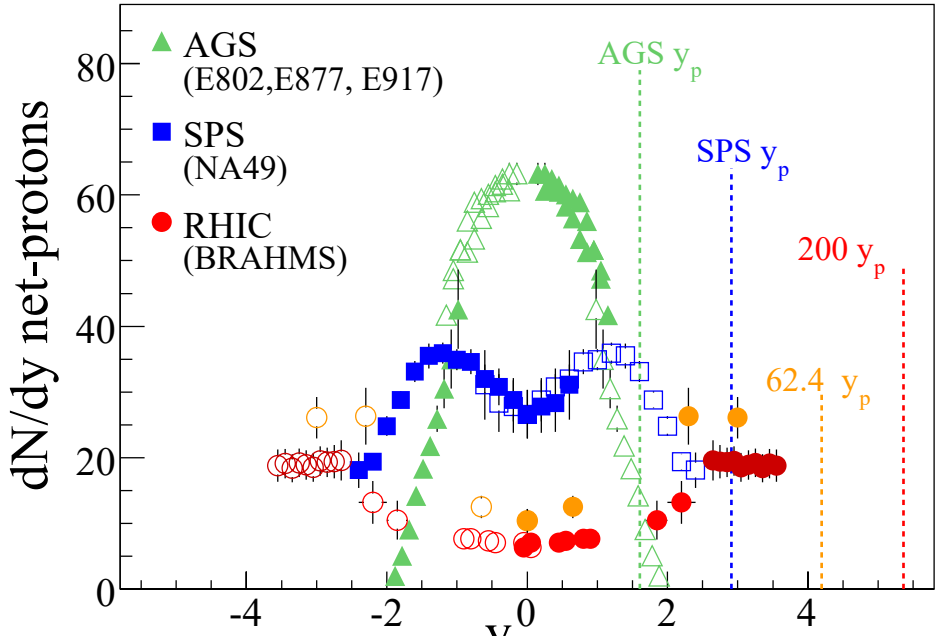


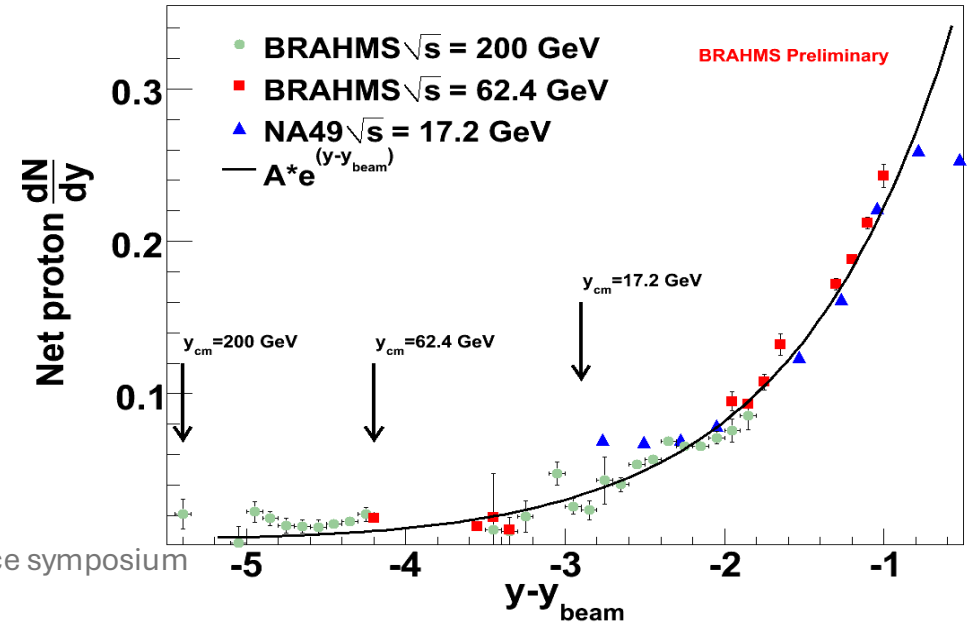


Baryon Transport

Key measurement

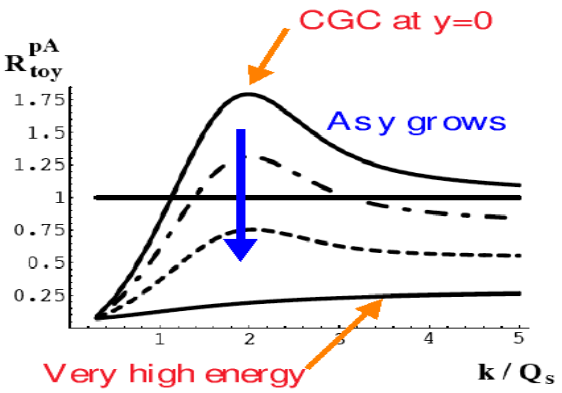
- Au-Au 0-10% central coll.
- Development of net-proton poor region at RHIC
- δy ~ 2.1 for central Au-Au collisions vs. ~0.9 in pp.
- pp distribution is consistent with the baryon junction picture apart from the smallest $y-y_{beam} > -2$





d-Au running

D. Kharzeev hep-ph/030737



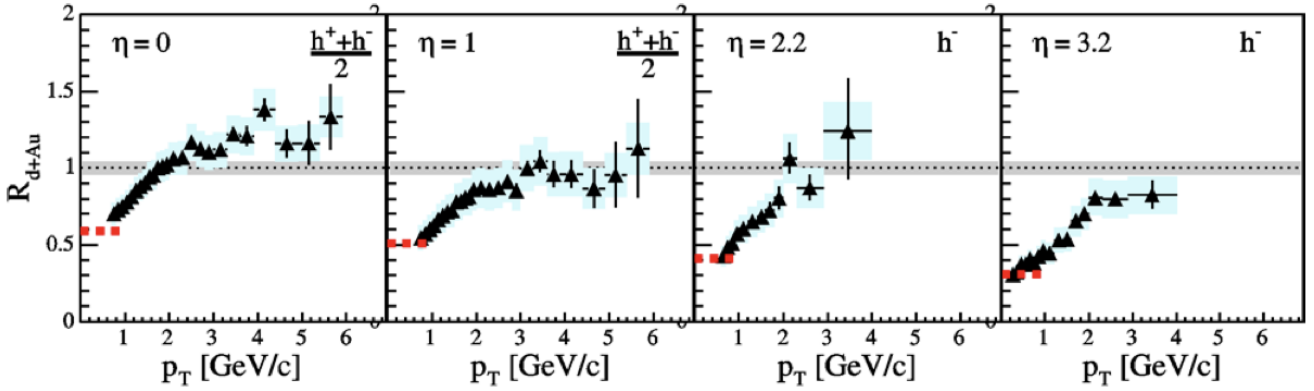
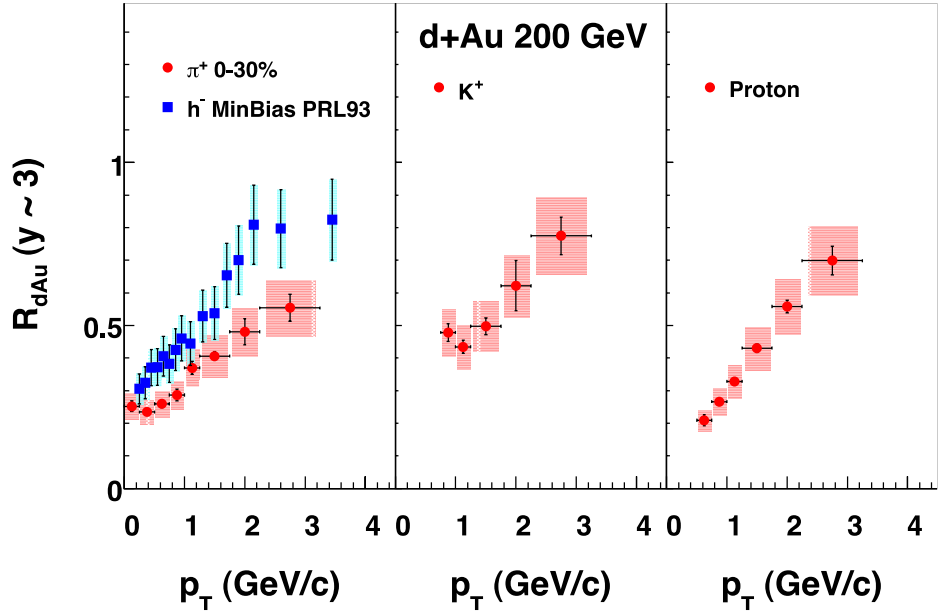


Fig. 17. Evolution of the nuclear modification factors measured by BRAHMS for the 10% most central $d + Au$ collisions at $\sqrt{s_{NN}} = 200$ GeV, as a function of pseudorapidity η [76].

- R_{dAu} for identified particle consistent with charged hadrons and all exhibiting R_{dA} <=1 for p_T<3 GeV/c
- π+ the dominant meson exhibits clear suppression
- These BRAHMS data did spur interest in gluon saturation being within reach at RHIC energies.

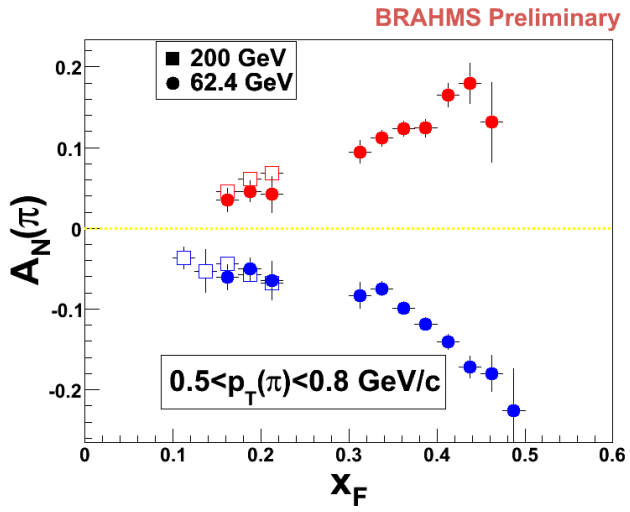


RHIC spin program

The BRAHMS program did not originally include pp spin physics, but discussion with the RHIC spin group lead us to be involved in this program and be ready to be part of it.

At the first pp run BRAHMS would not take spin data , as it was deemed you could not have 3 experiments taking spin data at the same time.

Later as machine performance was improved Brahms took extensive pp data in 2005 (200 GeV) and 2006 (62.4GeV)



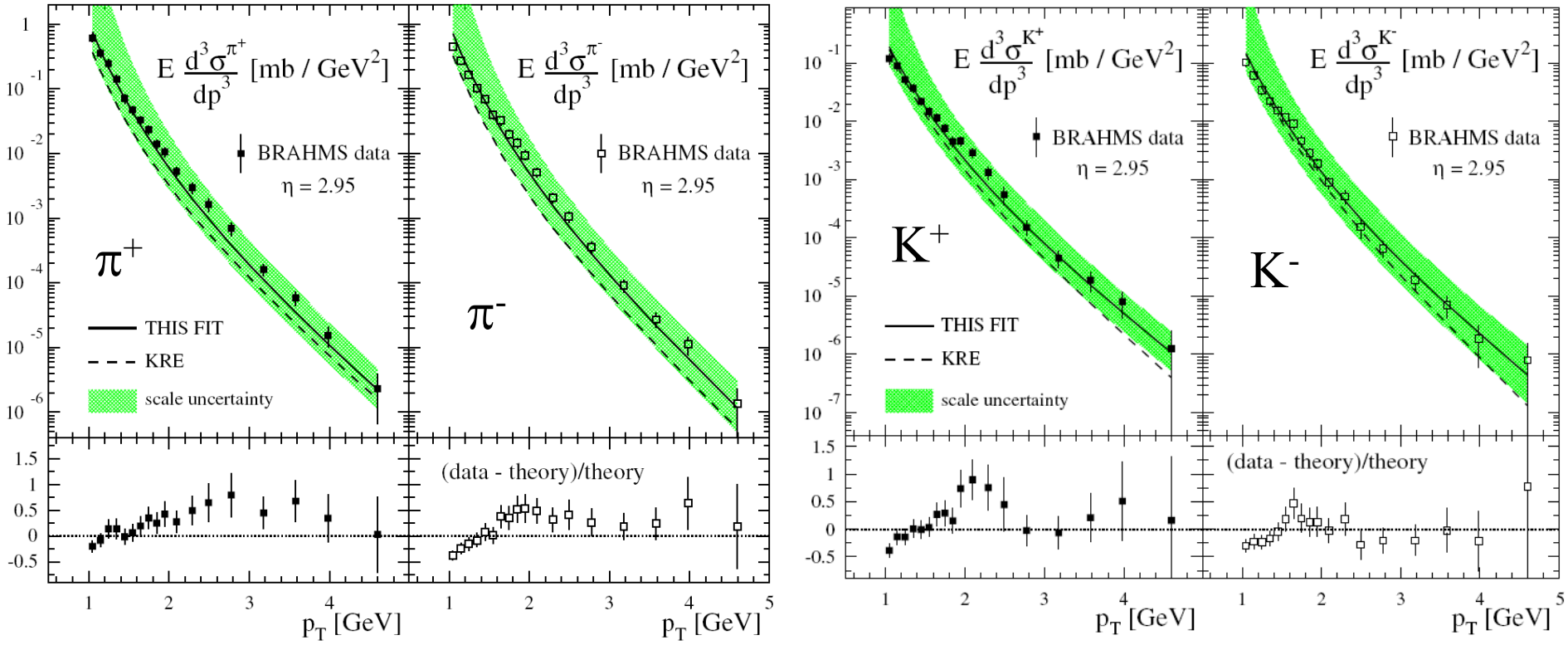
Observed Large $A_N(\pi)$: 0.3 at x_F~0.5

- Strong x_F -p_T dependence. $|A_N(\pi^+)|$ ~ $!A_N(\pi^-)|$
- Also measured K+-

Global fits to data
including BRAHMS large rapidity data

DSS, PRD **75,** 114010 (2007)

Brahms data: PRL **98, 252001 (2007)**



deFlorian, Sassot and Stratman performed a global fit including new data from Brahms at high rapidity. PRD **75,** 114010 (2007)

- Charged separated fragmentation functions
- Fragmentation functions significantly constrained compared to previous “state of the art” when adding RHIC data into fits.

Scientific output and contributions

Collaboration 10 institutions from 6 countries

23 Refereed publications

- Whitepaper with 2031 citations
- 4 papers, not WP, with over 250 citations
- 15 Ph.D. Theses

- After conclusion of Brahms many collaborator went on to be important collaborators at RHIC, LHC, and SPS program

Summary

The BRAHMS experiment have provided unique physics results in the forward region, providing insight into several key questions,

It has been most rewarding to be part of the RHIC program , that really gave rise to new understanding of the state of high energy density nuclear matter, and cold QCD physics.

I am sure that the new experiment(s) coming at EIC will be equally fruitful

Collaboration

I.Arsene[7], I.G. Bearden[6], D. Beavis[1], S. Bekele[6] , C. Besliu[9], B. Budick[5],
H. Bøggild[6] , C. Chasman[1], C. H. Christensen[6], P. Christiansen[6], H.Dalsgaard, R.Debbe[1],
J. J. Gaardhøje[6], K. Hagel[7], H. Ito[10], A. Jipa[9], J. I. Jordre[9], E.B. Johnson[10],
C.E.Jørgensen[6], R. Karabowicz[3], N. Katryńska[3], E. J. Kim[4], T.M.Larsen[11], J. H. Lee[1],
Y. K. Lee[4], S.Lindal[11], G. Løvhøjden[2], Z. Majka[3], M. Murray[10], J. Natowitz[7], B.S.Nielsen[6],
C.Nygaard, D. Ouerdane[6],
D.Pald, R.Planeta[3], F. Rami[2], C. Ristea[6], O. Ristea[9], D. Röhrich[8],
S. J. Sanders[10], R.A.Sheetz[1], P. Staszel[3],
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