HEP Model Verification

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Outline

- Existing verifications

- Required verifications

  – urgent

  – desired

- Data provided by experiments

  – recent results

  – new proposals

Existing Verifications

- G. Folger's recent plots
  - 250 – 400 GeV/c

- G3/G4 verifications (H. Fesefeldt's page)
  - 37 GeV/c,
  - 100-360 GeV/c

- A. Ribon's test suite (under construction)
  - 100 GeV/c pi, K, p, pbar => y, p_T

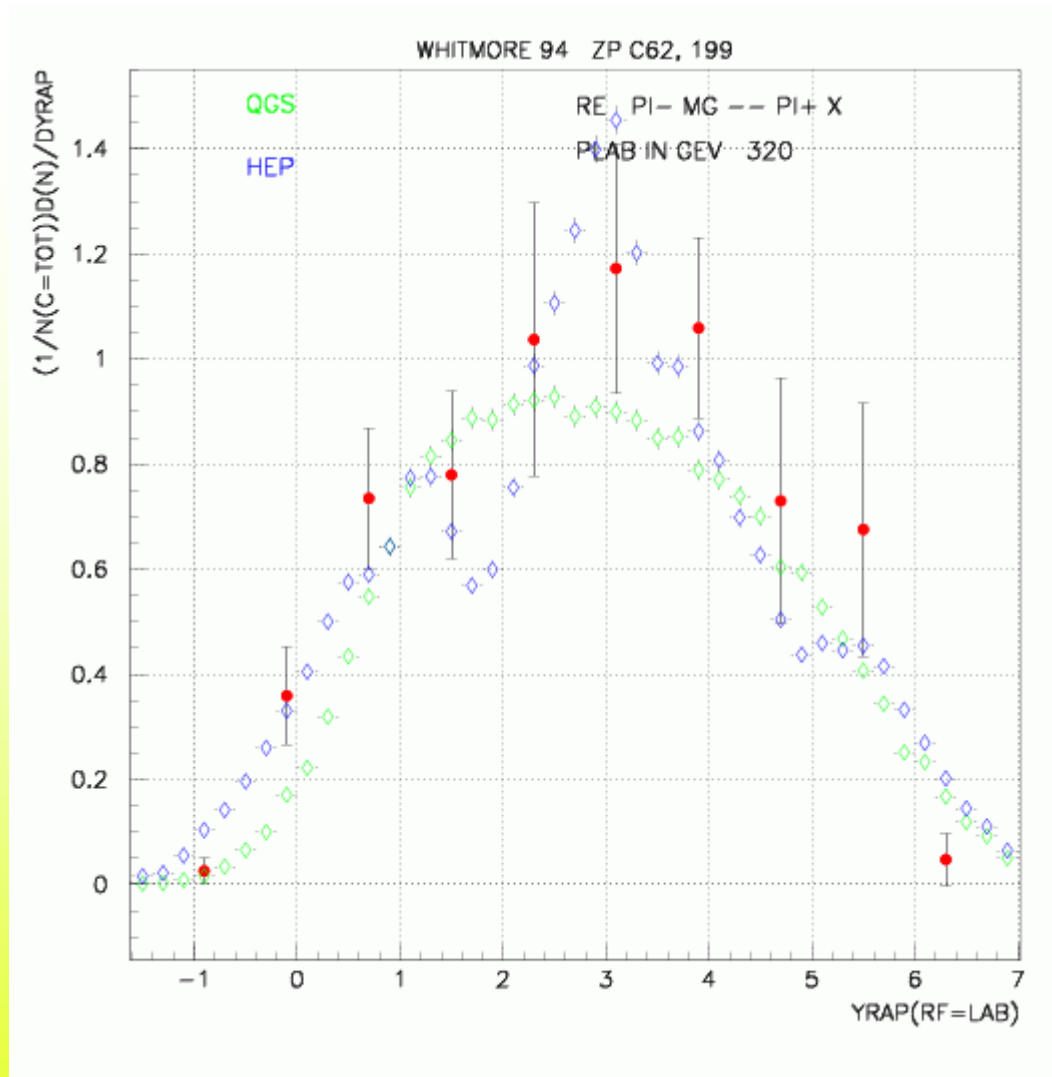- T. Koi's p-p tests
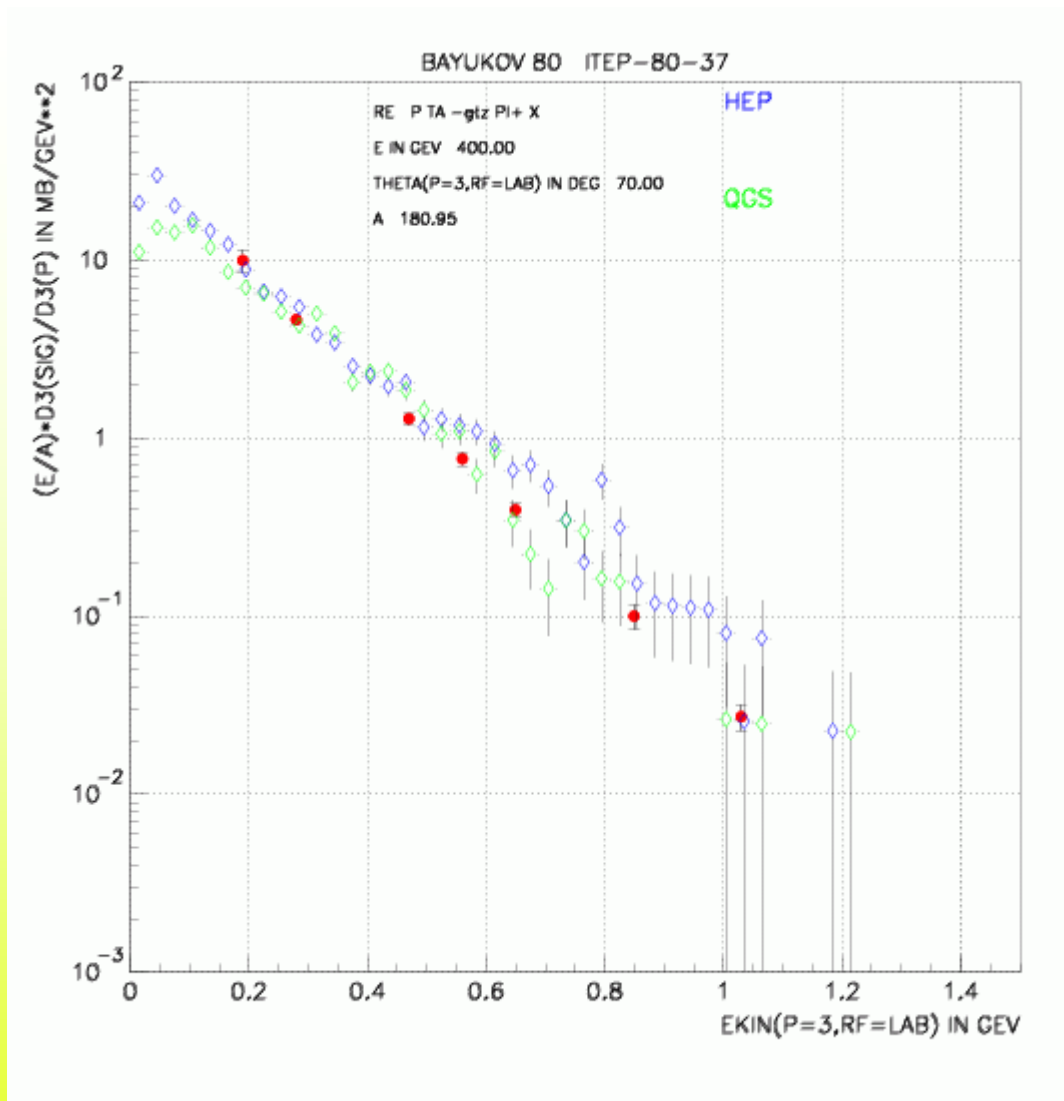 - up to 1.79 TeV (16 TeV in preparation)

250 GeV/c p on Al, Au

320 GeV/c p

WHITMORE 94   ZP C62, 199

QGS

HEP

RE PI- MG -gtz PI+ X

PLAB IN GEV 320
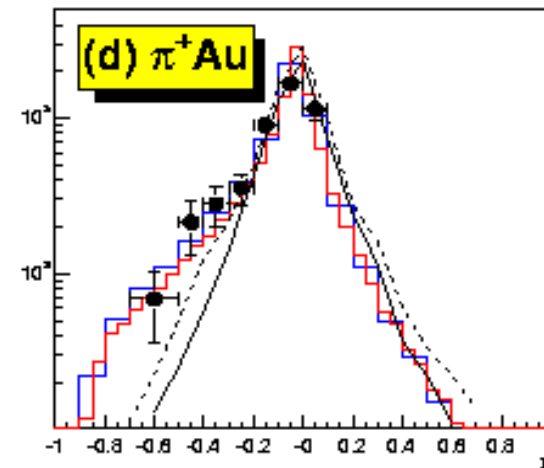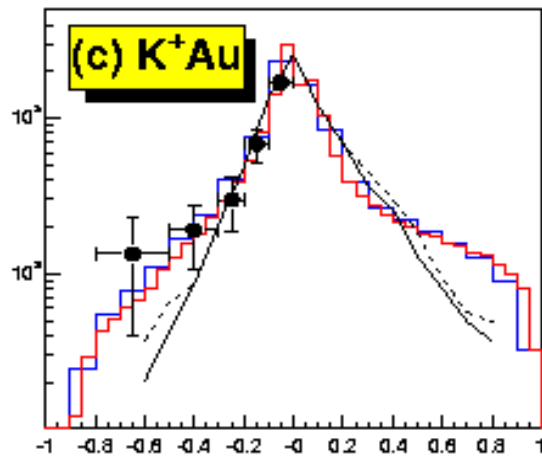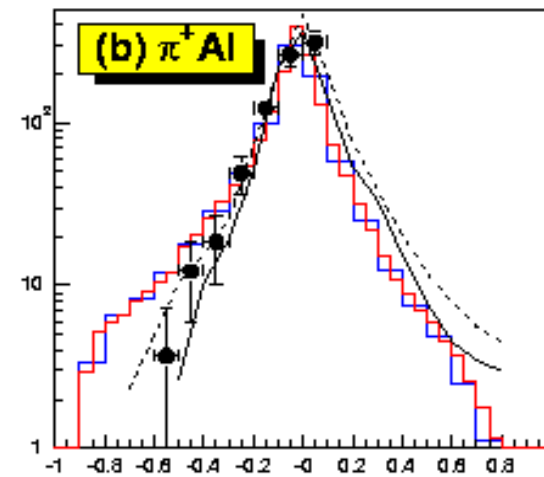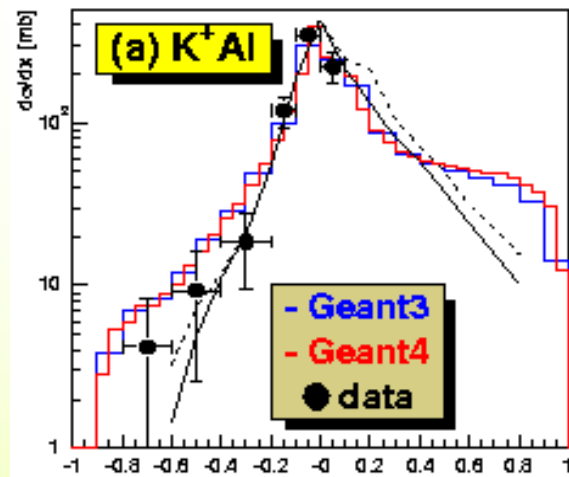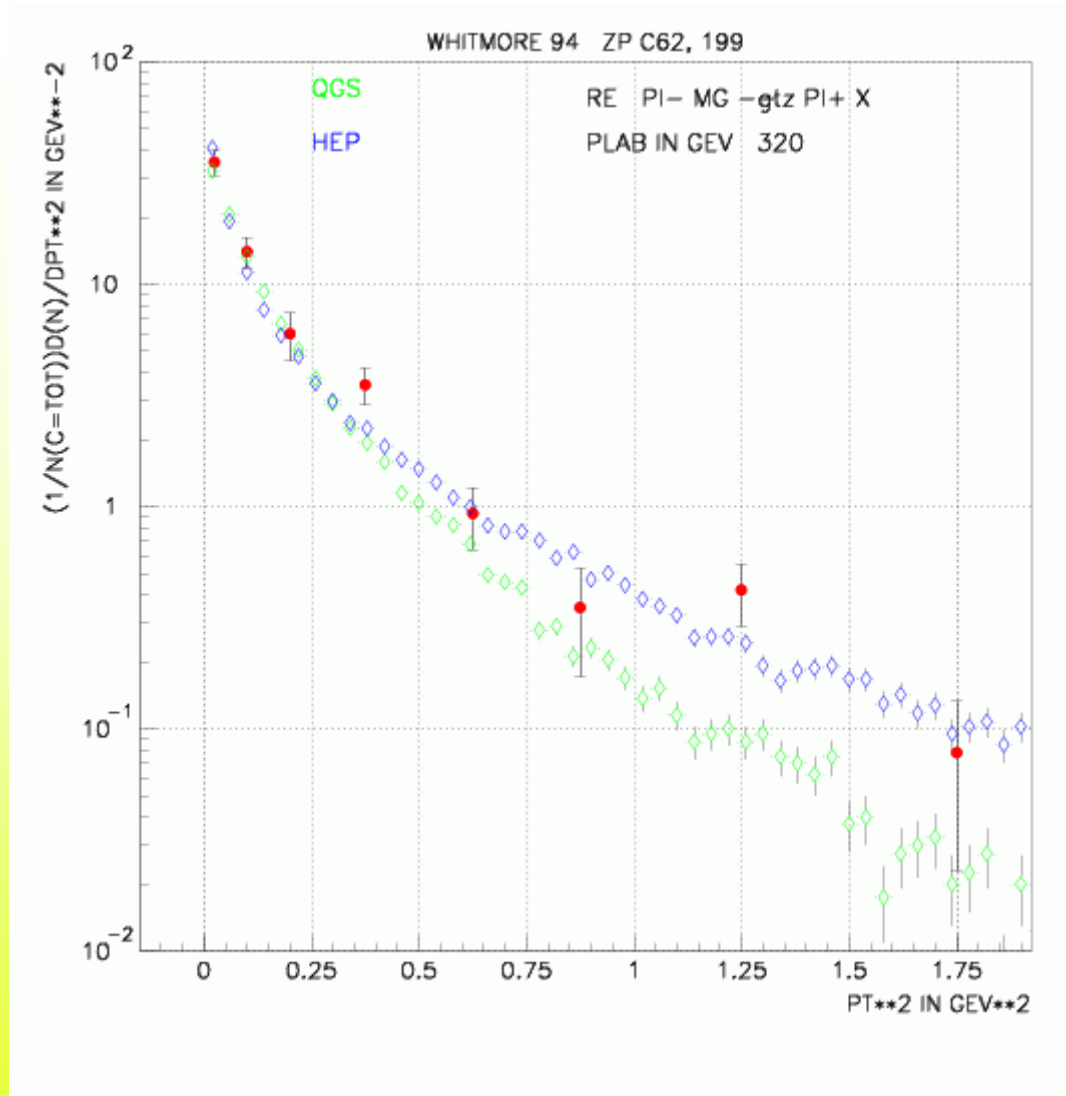
320 GeV/c p on rapidity

400 GeV p+Ta   inclusive pi+

Required Verifications (1)

- HEP models cover the same energy range as the QGSP and QGSC models

    - ~20 GeV < E < ~100 TeV

    - whatever is used to verify QGS can be used for HEP

    - p-p well-covered

    - but HEP is the only model treating anti-baryons

- Most urgent verifications:

    - repeat GHEISHA verifications to check current HEP code

Required Verifications (2)

- Desired (but not urgent) verifications:

    – (pbar,pX), (pbar,nX), (nbar,pX), (nbar,nX) on various A with pbar energy above 20 GeV

- Measured quantities required:

    – $d\sigma/dp_T^2$, $d^2\sigma/dp_T/dy$, etc. of secondary particle

Data Provided by Experiments

- C. De Marzo et al., Phys. Rev. D26, 1019 (1982).

  - 200 GeV/c pbar on p, Ar, Xe => multiplicity

- J. J. Whitmore et al., Z.Phys. C62, 199 (1994).

  - 100 GeV/c pbar on nuclei

New and Recent Experiments

- MIPP

    - up to 85 GeV/c beams of $\pi^{+/-}$, $K^{+/-}$, p, pbar

    - wide range of A

    - upgrade could include n, nbar, K^0_L tagged beams of 10 GeV/c $<$ p $<$ 60 GeV/c

Summary

- HEP models cover same range as QGS

  - some validations already done concurrently with QGS

  - only HEP can handle anti-baryons

- Verification needed :

  - any pbar induced data

  - repeat verifications of H. Fesefeldt to check code

- Need nuclear target data for E > 400 GeV - still doing literature search for published data at high energies

- MIPP upgrade could supply data for lower part of HEP range