(A Biased View on the)

Status and Prospects in EM Probes

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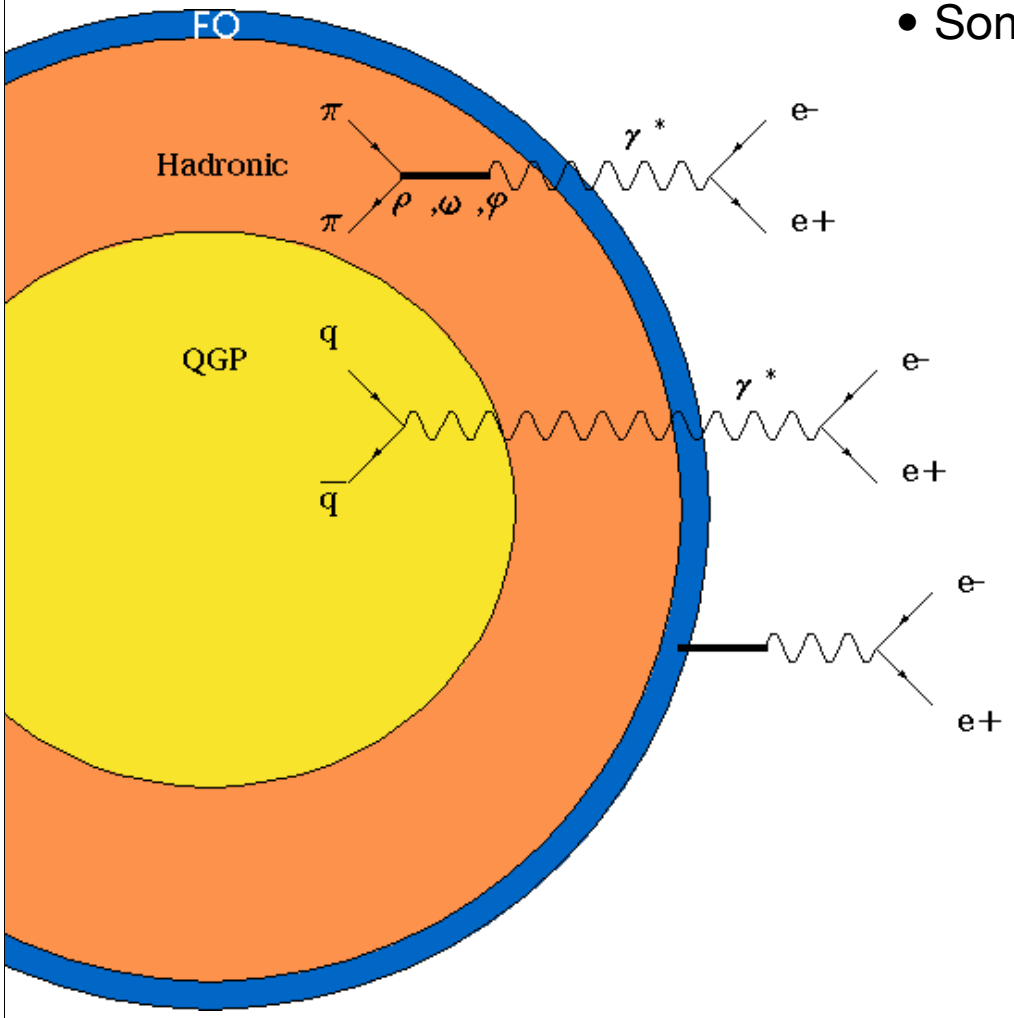
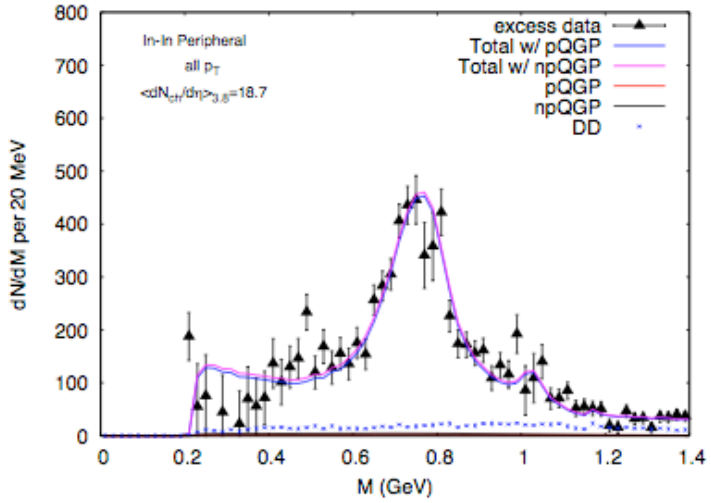
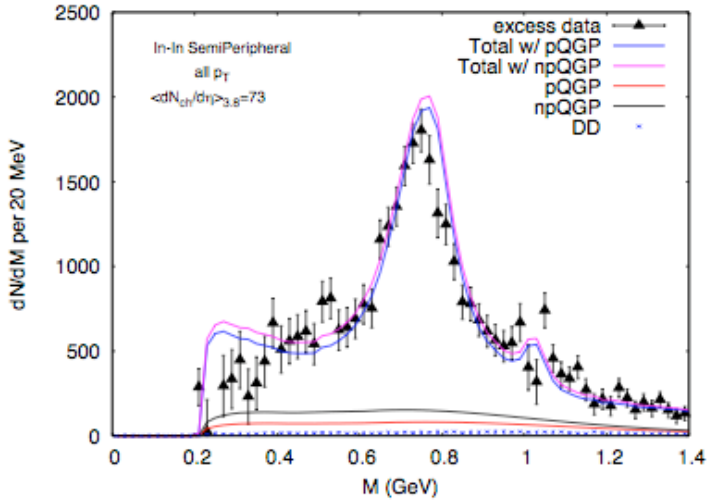
Introduction

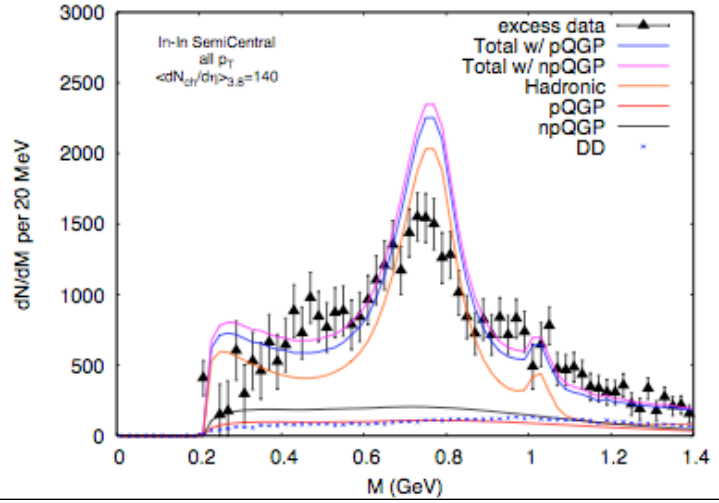


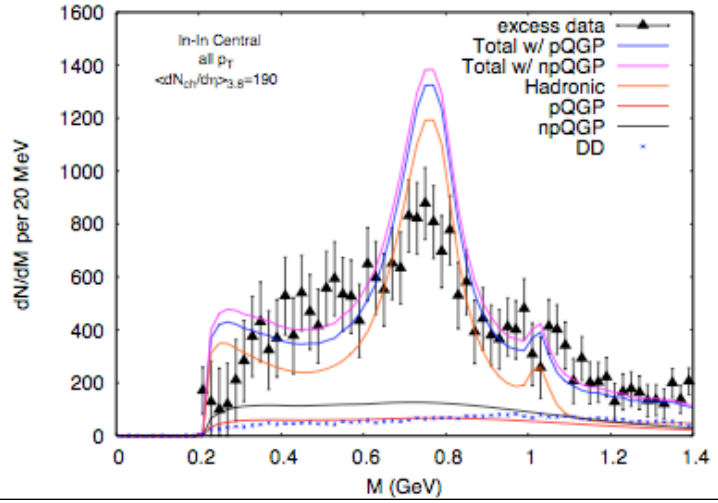
- Some goals:
  - Initial State: τ_0, T_0
  - Direct signal of the QGP
  - signal of χSR
  - Transport Coefficients of QGP
  - Information on EoS

NA60

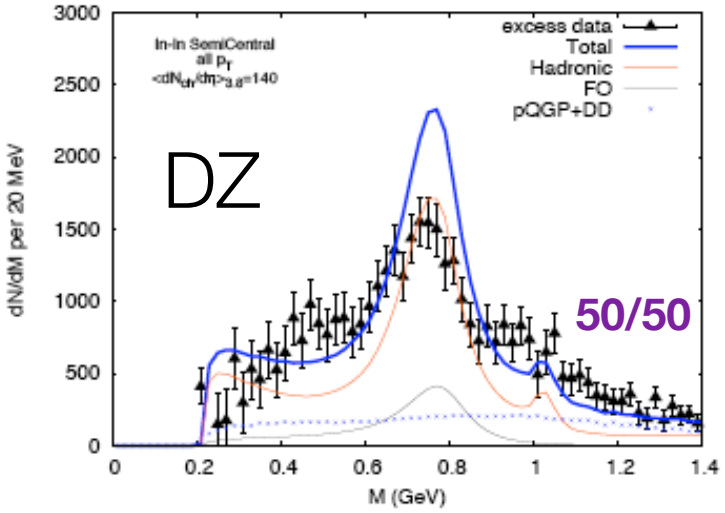

In-In Peripheral
all p_T
$<dN_{ch}/d\eta>_{3.8}$=18.7
excess data
Total w/ pQGP
Total w/ npQGP
pQGP
npQGP
DD
dN/dM per 20 MeV
M (GeV)

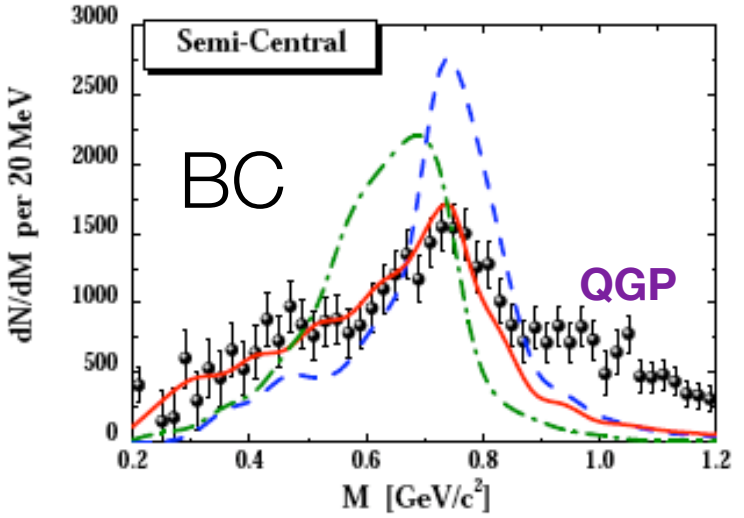

In-In SemiPeripheral
all p_T
$<dN_{ch}/d\eta>_{3.8}$=73
excess data
Total w/ pQGP
Total w/ npQGP
pQGP
npQGP
DD
dN/dM per 20 MeV
M (GeV)

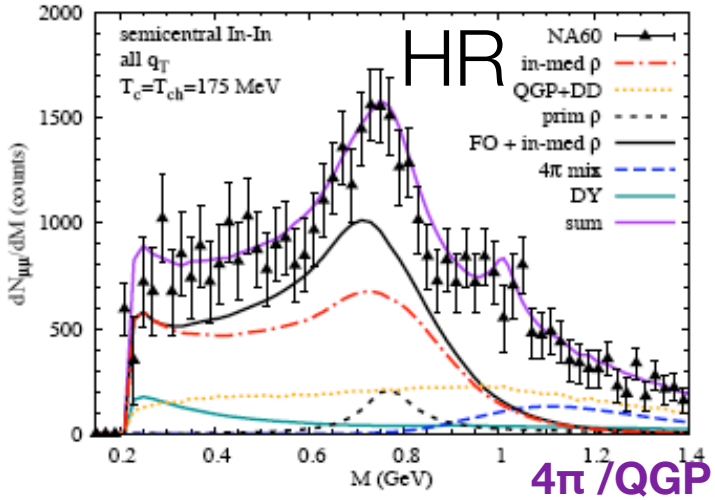

In-In SemiCentral
all p_T
$<dN_{ch}/d\eta>_{3.8}$=140
excess data
Total w/ pQGP
Total w/ npQGP
Hadronic
pQGP
npQGP
DD
dN/dM per 20 MeV
M (GeV)

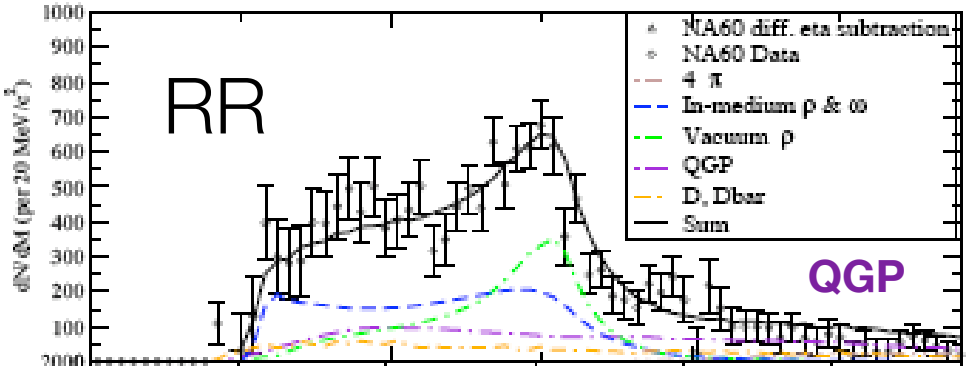

In-In Central
all p_T
$<dN_{ch}/d\eta>_{3.8}$=190
excess data
Total w/ pQGP
Total w/ npQGP
Hadronic
pQGP
npQGP
DD
dN/dM per 20 MeV
M (GeV)

NA60: Theory Comparison





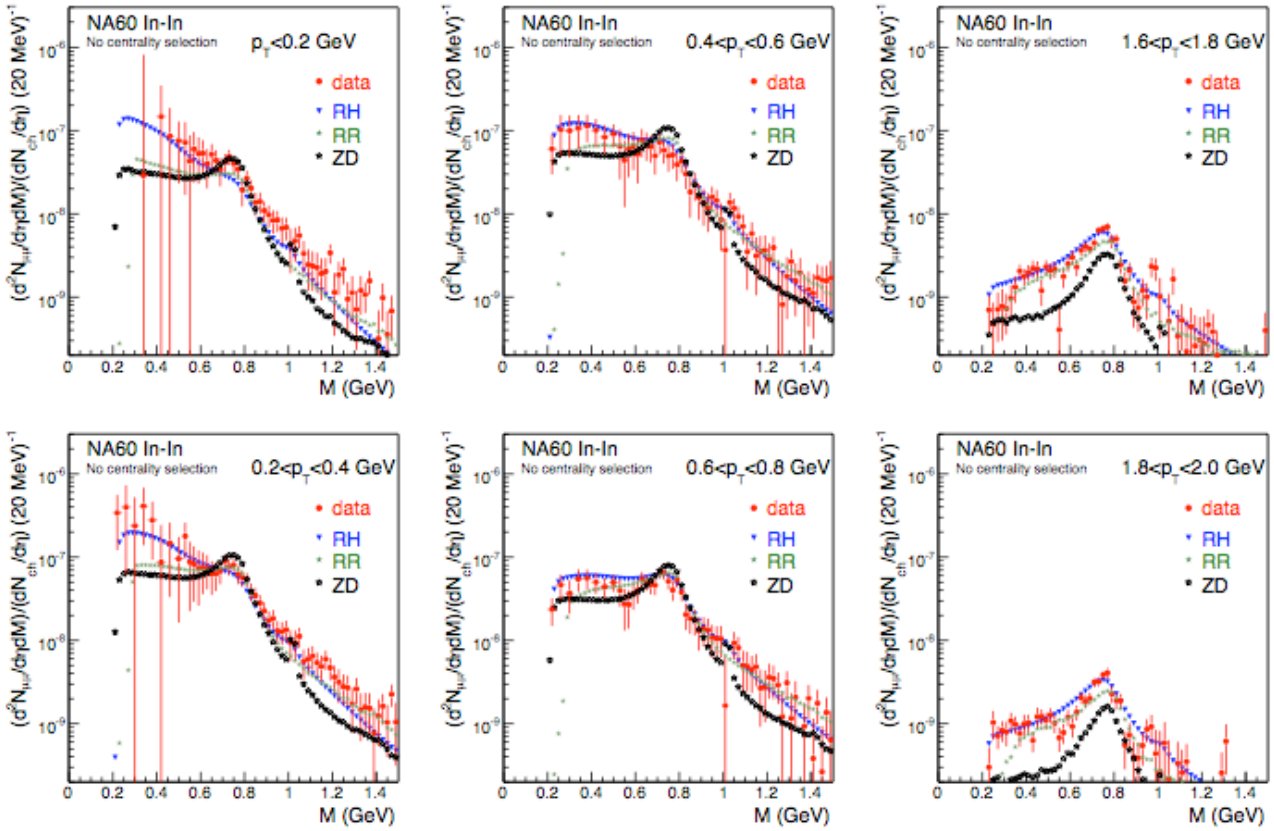




4π /QGP

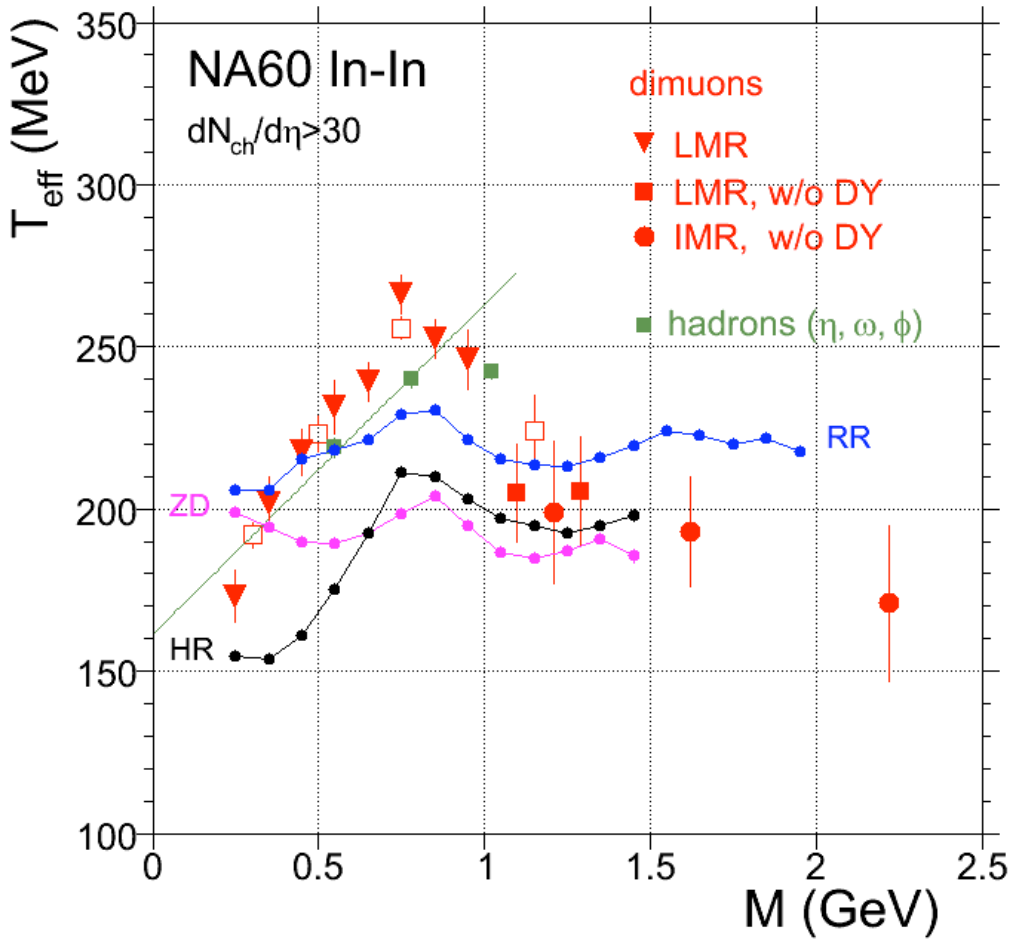
(EoS Dependent)

Acceptance Corrected NA60



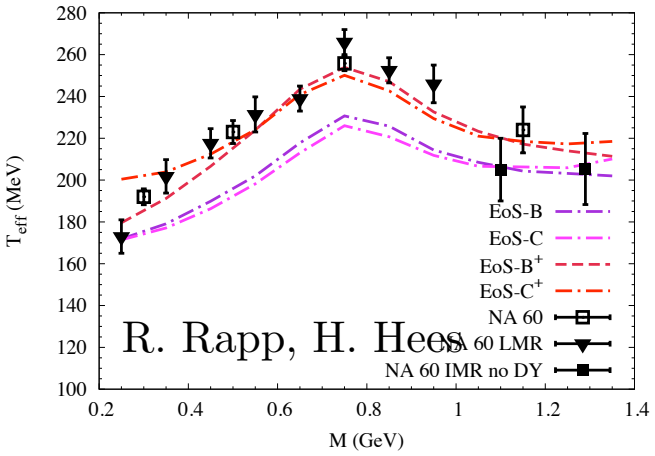
NA60 T_{eff}: Theory Comparison

- Consistently underestimate T near ρ mass



T_{eff} at NA60

1. Adding flow

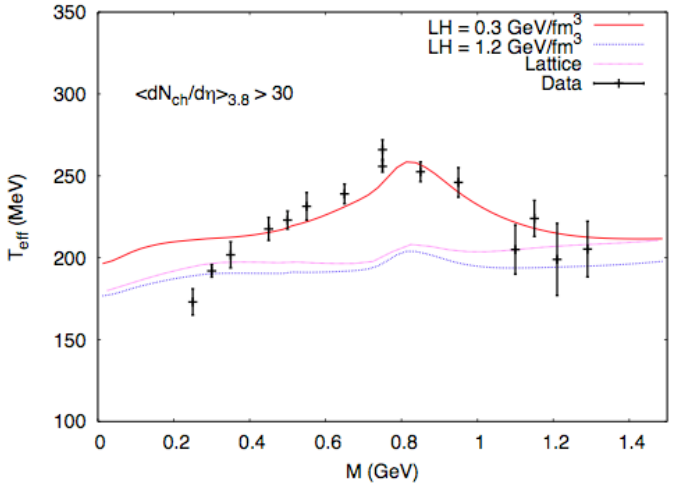


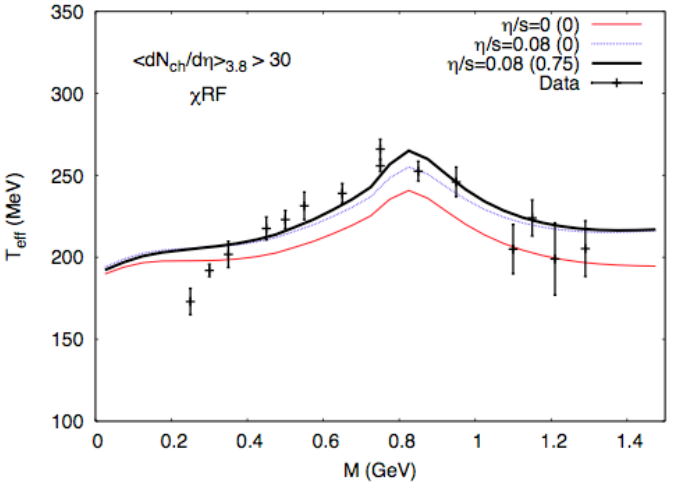
2. Adding Viscosity

Difficult to disentangle source of IMR

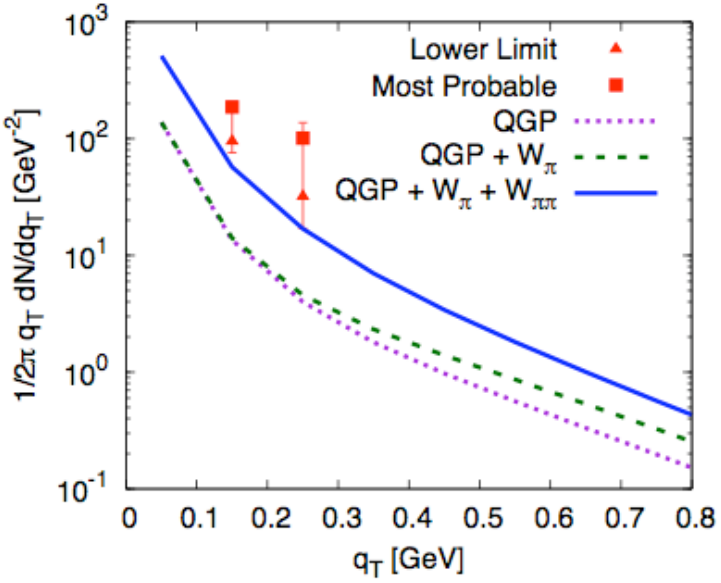
But we can still learn a lot.

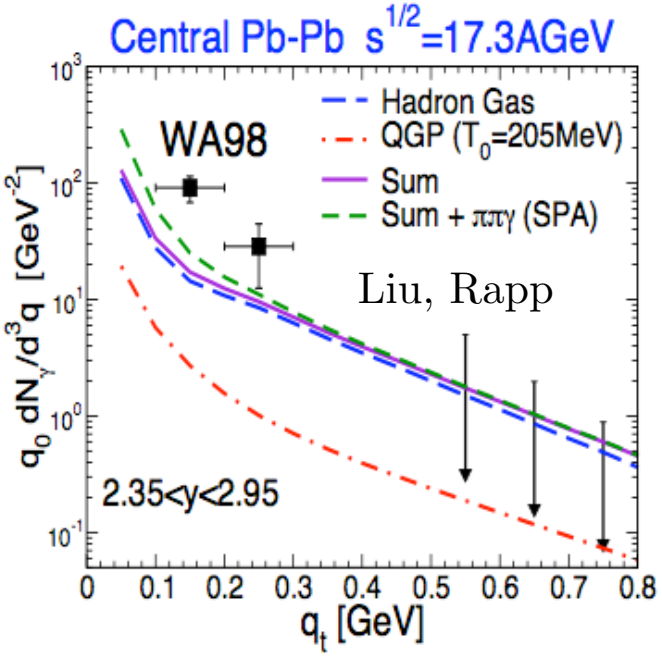
Changing the EoS





Prospects for HBT measurements



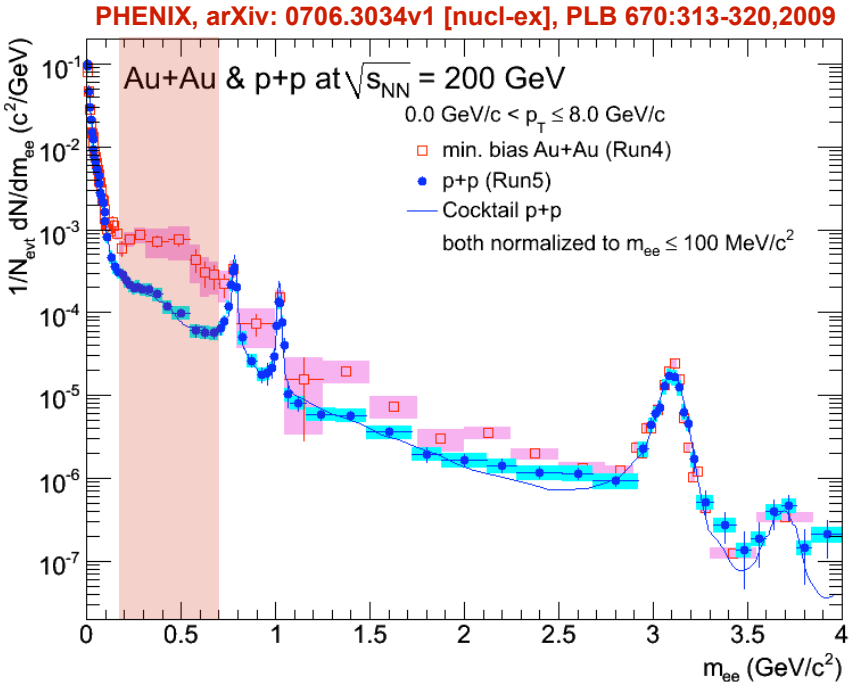


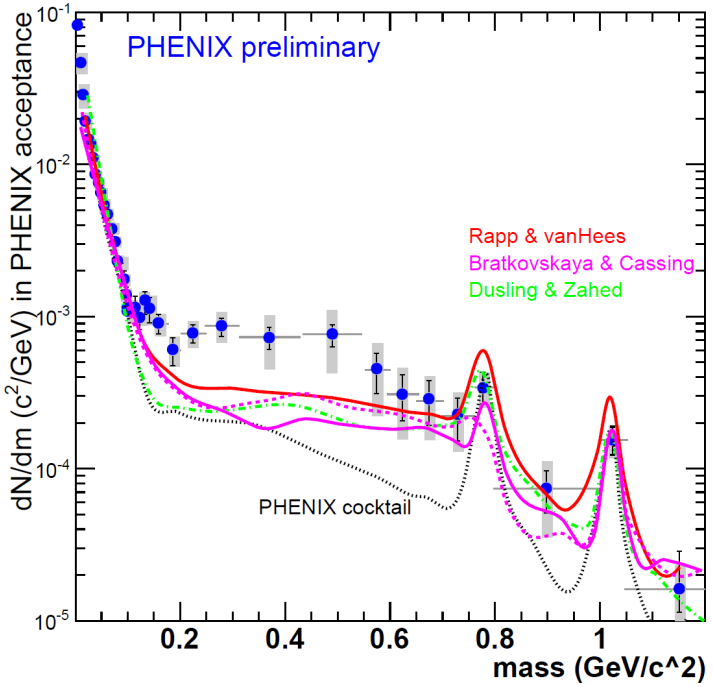
Can one possibly place constraints on the conductivity of the medium?

This would be a really important measurement if done at RHIC.

PHENIX di-electron

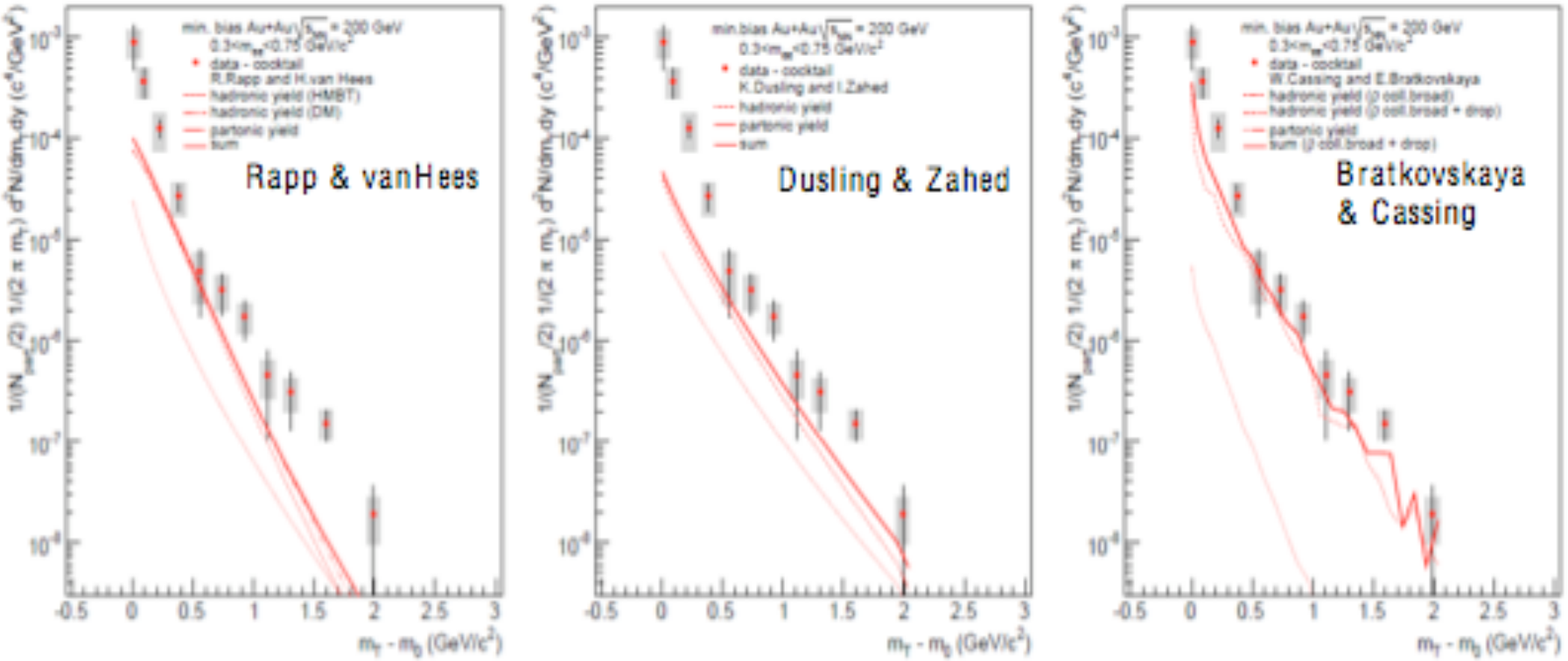
- All theory groups underestimate yield in M = 0.2 - 0.5 GeV





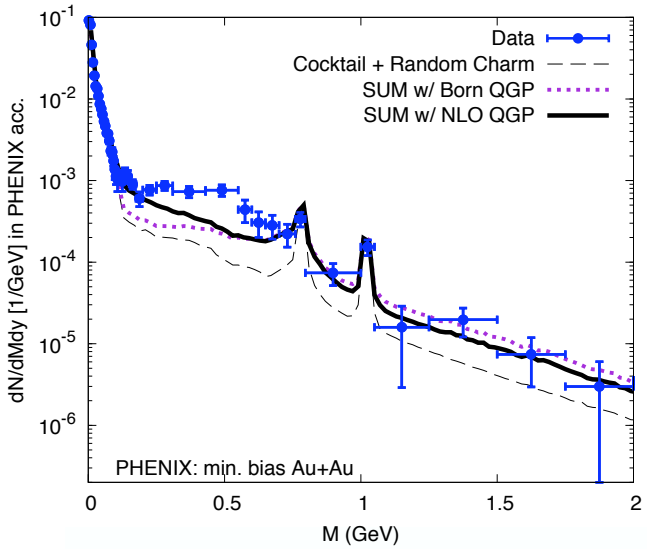
P_T Spectra

1. Low p_T source (with a low "temperature")

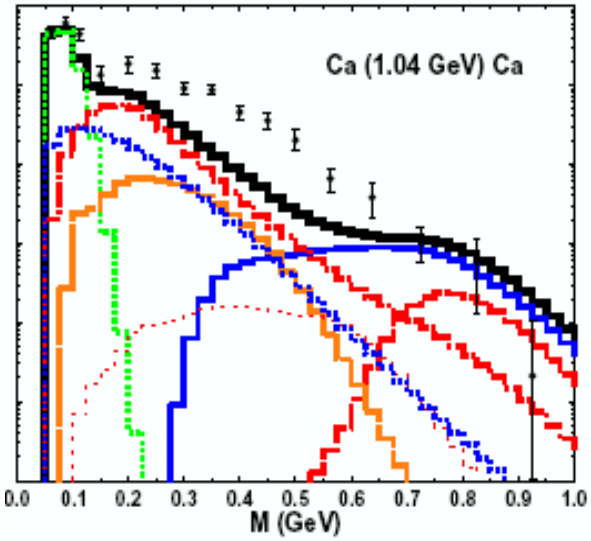


We should have a solid baseline.

1. Leading Order QGP

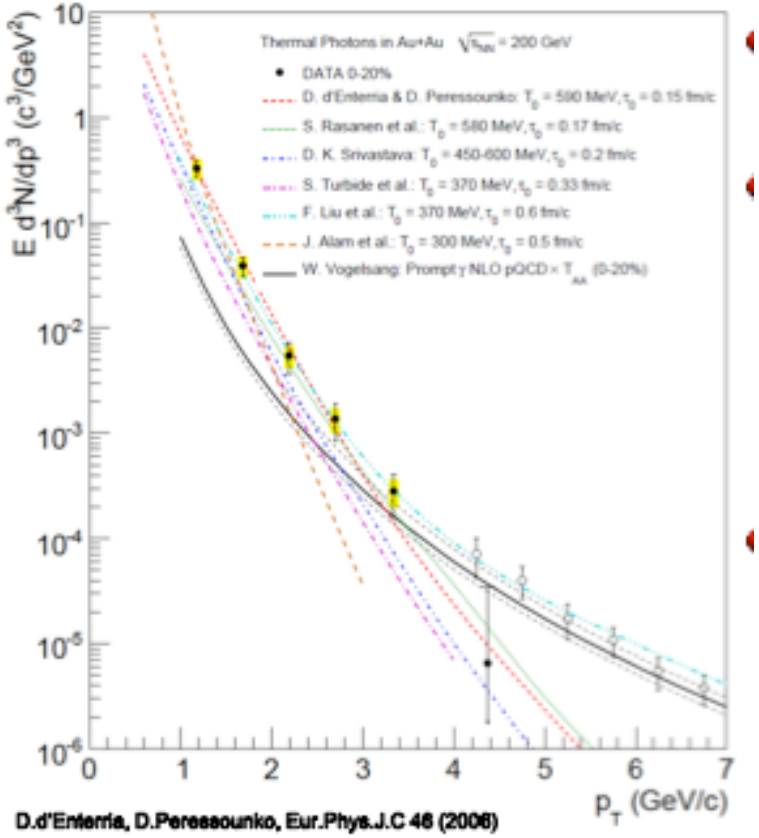


2. don't forget DLS Puzzle
   - d+Au and Cu+Cu will clarify this



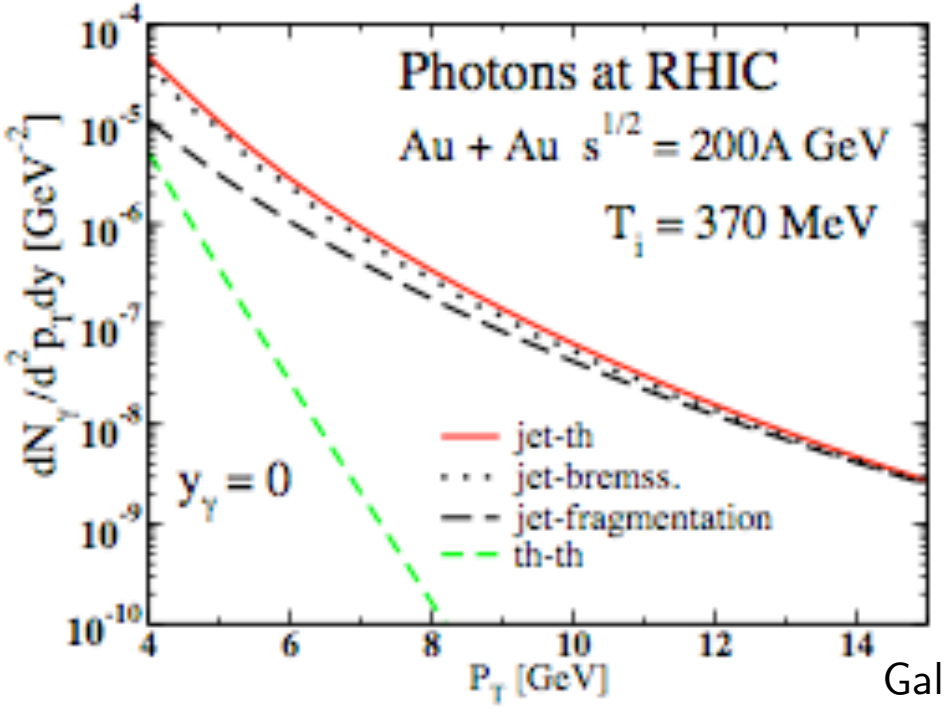
Photons at PHENIX

1. Consistent with expectations
2. But remember, these are really just di-electrons and this may have consequences for the interpretation.



Prospects for Intermediate and High Pt Photons

1. Jet-Medium interactions provide a new source of photons



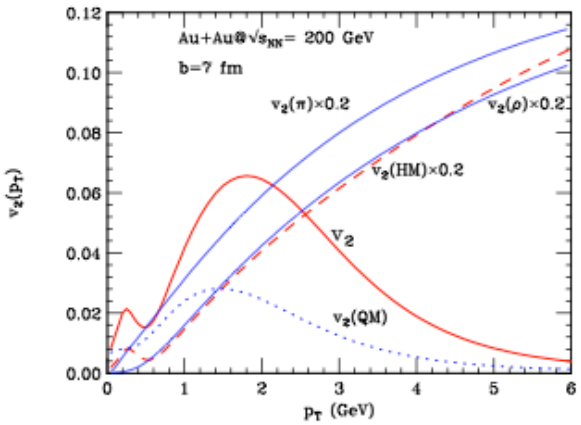
Gale: 0904.2184

R.J.Fries, B.Muller, D.K.Srivastava,
S.Turbide, S.Jeon, G.D.Moore

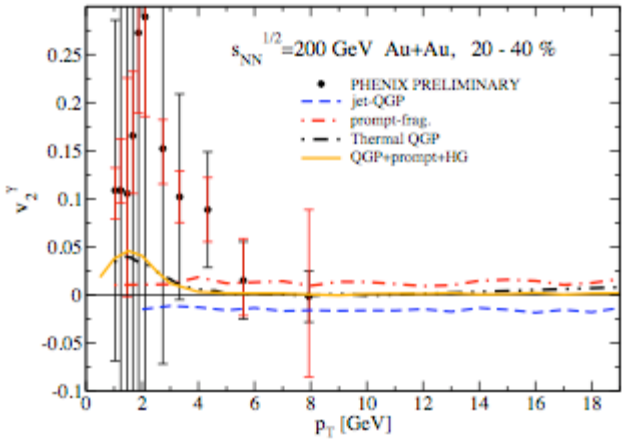
Prospects for photon v_2

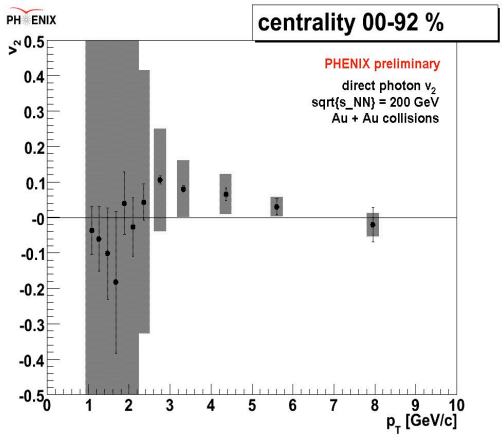
1. jet-medium gives a negative v2

R. Chatterjee, E. S. Frodermann, U. W. Heinz and D. K. Srivastava

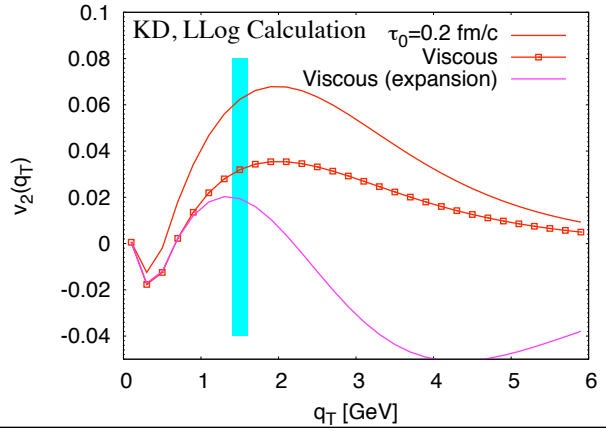


S.Turbide,C.Gale,E.FrodermannandU.Heinz



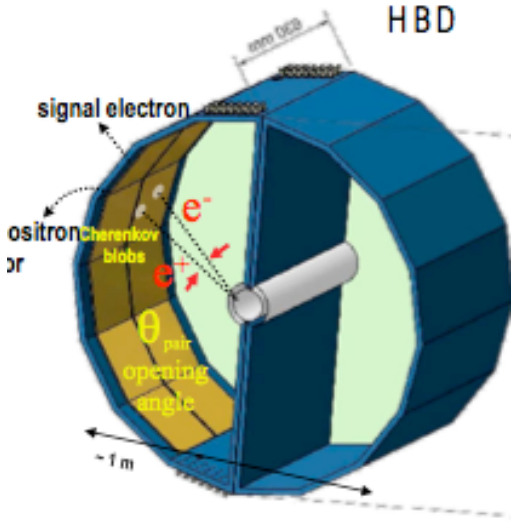


2. Viscosity is a large effect



Run 10

1. 10 weeks of Au-Au collisions at √sNN = 200 GeV, to exploit the PHENIX Hadron Blind Detector (HBD). Since this is a unique dataset for the HBD, we consider it of very high importance that sufficient statistics be accumulated for a definitive measurement of the low-mass vector channel spectral function in central 200 GeV Au-Au collisions.



Conclusions

My apologies to anyone I missed!

- Qualitatively Understand NA60 Data
  - Need detailed modeling for IMR and T_{eff}
  - We need to quantify what we have learned.

- No theory group can explain LMR excess at PHENIX
  - Low mass, Low p_T source - difficult to handle theoretically
  - We should have a solid baseline before trying exotic sources.

- **Can no longer treat jet quenching and EM probes separately**
- **Can no longer treat viscosity and EM probes separately**

- Run 10 should be very exciting with HBD
  - looking forward photon v2, hbt, LMD, IMD, etc ....