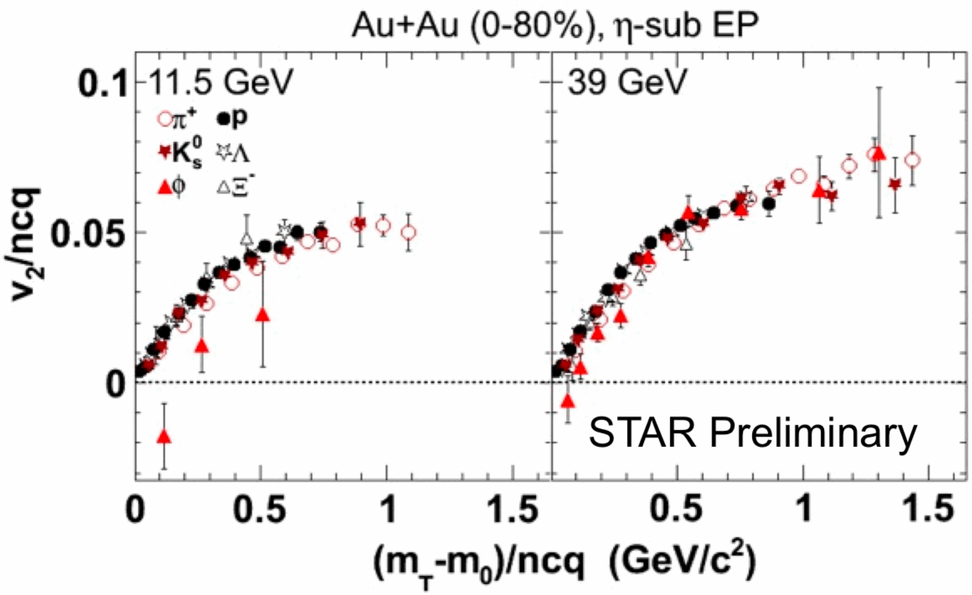
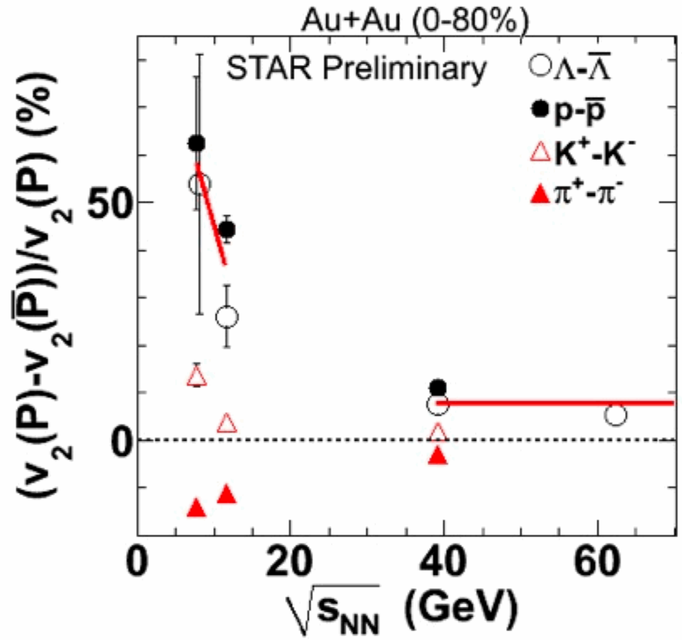
RHIC-STAR
Plenary
Hiroshi Masui

Azimuthal anisotropy v_2

Alexander Schmah,
Mon/23, 18:50

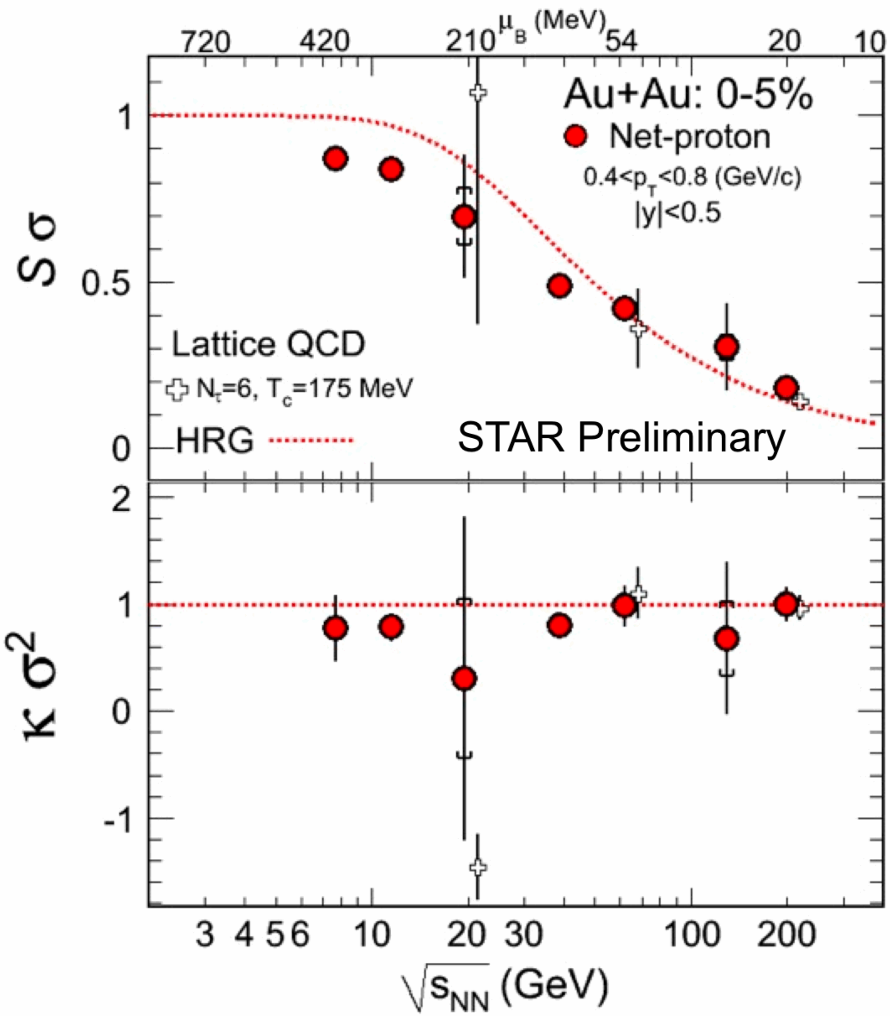
*62.4 GeV Λ-$\bar{\Lambda}$: STAR, **PRC75**, 054906 (2007)*





- $v_2(\phi)$ does not follow the trend for other hadrons at 11.5 GeV
- Significant difference of v_2 between baryon and anti-baryon at 7.7 and 11.5 GeV

Higher moments of net-proton



*19.6, 62.4 and 200 GeV: STAR, **PRL105**, 022302 (2010)*

Xiaofeng Luo, poster board 141, Thu/26

Terence Tarnowsky, Mon/23 16:00

$$S\sigma = \chi_B^{(3)}/\chi_B^{(2)}$$

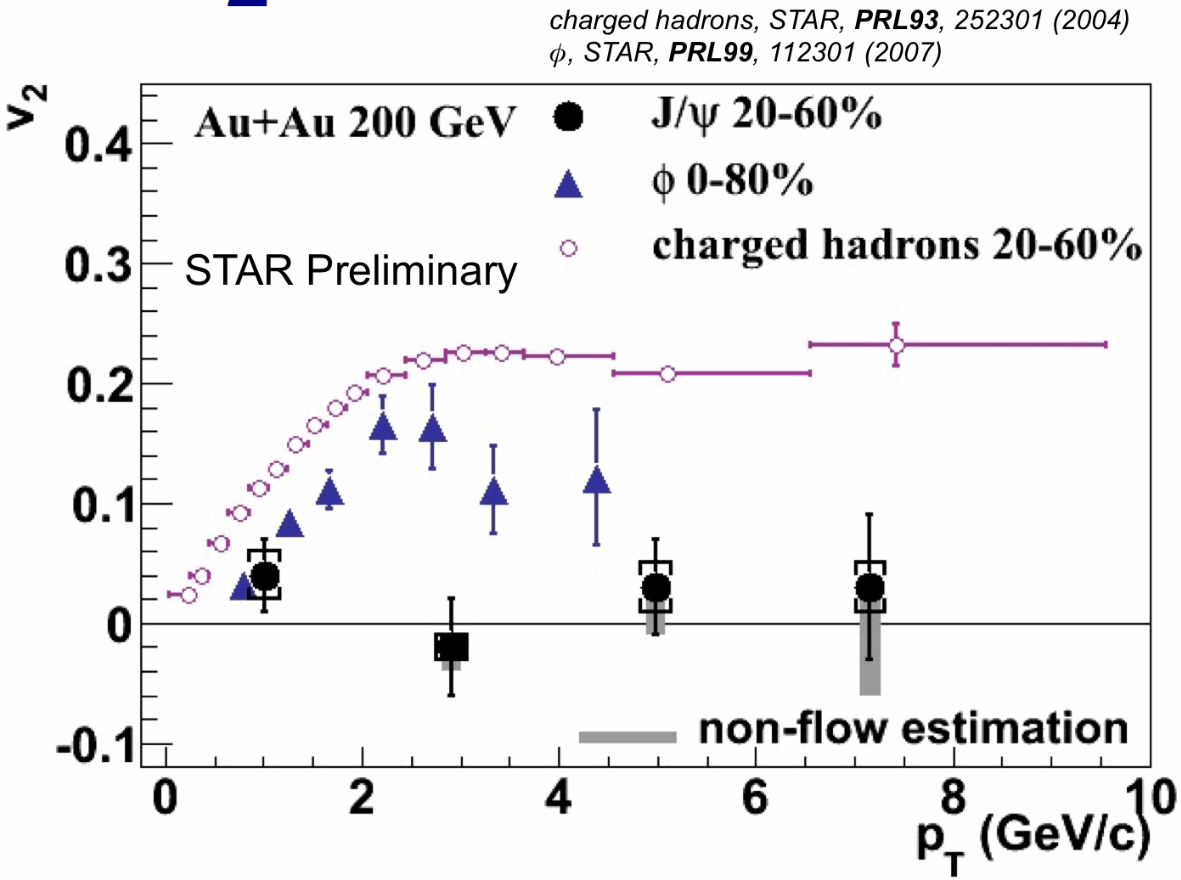
$$\kappa\sigma^2 = \chi_B^{(4)}/\chi_B^{(2)}$$

1. Connection to susceptibilities
2. Higher order, more sensitivity to the correlation length

- Consistent with Lattice QCD and Hadron Resonance Gas (HRG) model at higher energies
- Start deviating from HRG model at 39 GeV

RHIC-STAR, Plenary
Hiroshi Masui

J/Ψ v_2



Hao Qiu, poster board 60, Thu/26

Zebo Tang, Tue/24 15:40

RHIC-STAR, Plenary Hiroshi Masui

- *J/ψ* v_2 ~ 0 up to p_T ~ 8 GeV/c in mid-central 20-60%

➡ Disfavors coalescence from thermalized charm quarks

Theory Comparison: Direct Photon v_2

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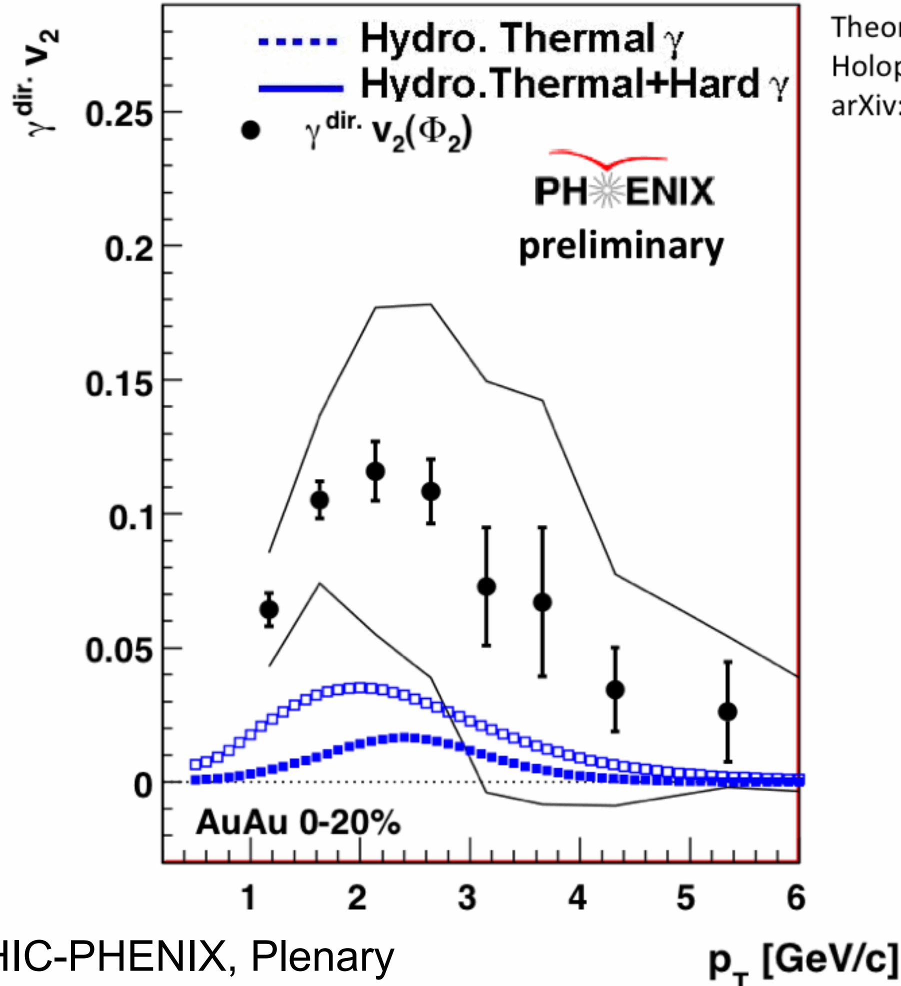


RHIC-PHENIX, Plenary
Stefan Bathe

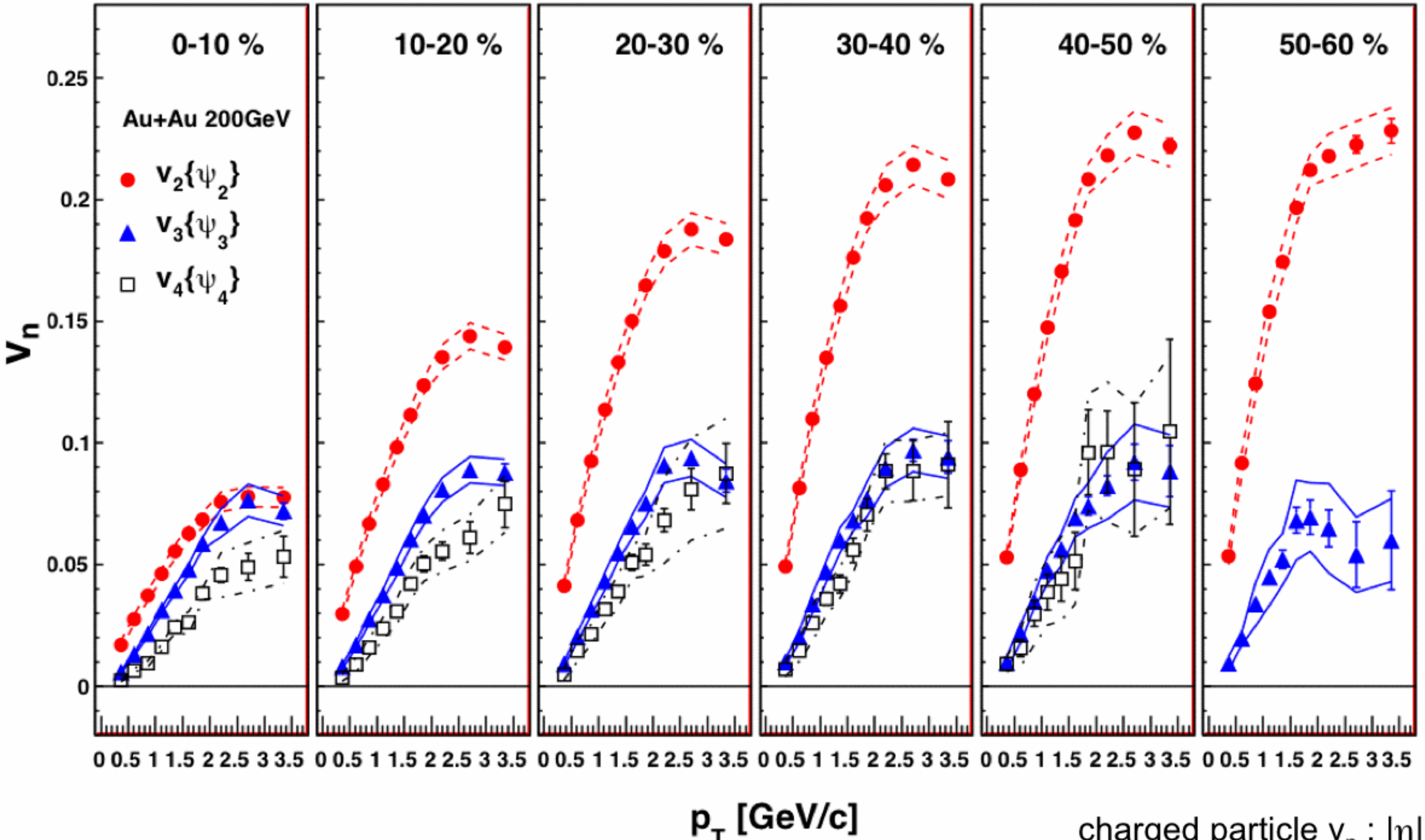
Theory calculation:
Holopainen, Räsänen, Eskola
arXiv:1104.5371v1

- Models under-predict direct photon v_2
- Measurement further constrains T_i and τ_i
- Challenge to theorists

Plenary: S. Esumi (flow), Tue
Parallel: E. Kistenev (direct photons) Thu

$v_2\{\Phi_2\}$, $v_3\{\Phi_3\}$, $v_4\{\Phi_4\}$ at 200GeV Au+Au

arXiv:1105.3928



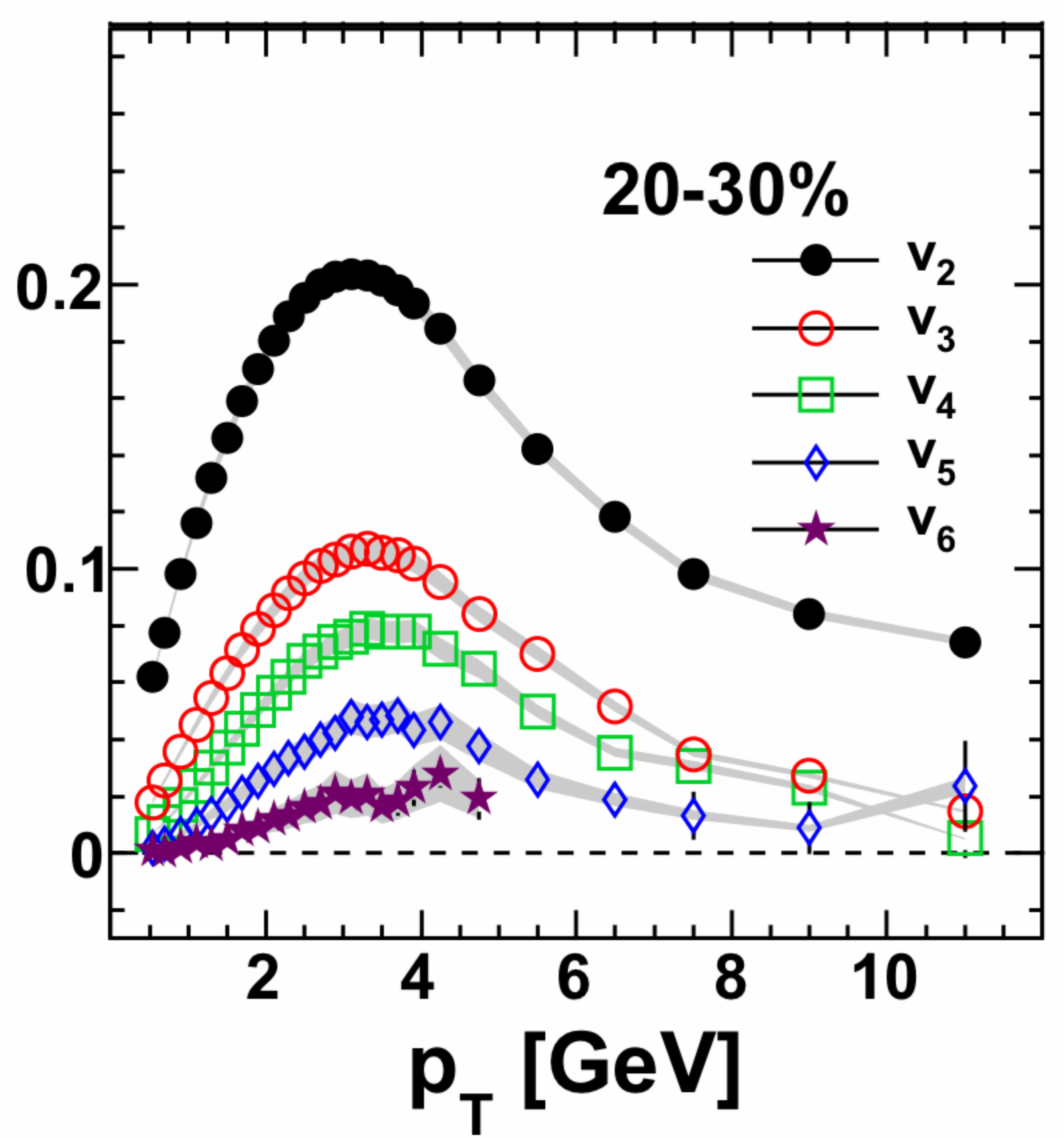
RHIC-PHENIX
Flow plenary
S.E.

charged particle v_n : $|\eta|<0.35$
reaction plane Φ_n : $|\eta|=1.0\sim2.8$

(1) v_3 is comparable to v_2 at 0~10%
(2) weak centrality dependence on v_3
(3) $v_4\{\Phi_4\} \sim 2 \times v_4\{\Phi_2\}$
(4) almost same down to sqrt(s_{NN})=39GeV

All of these are consistent with initial fluctuation.

LHC-ATLAS
Flow plenary
Jiangyong Jia



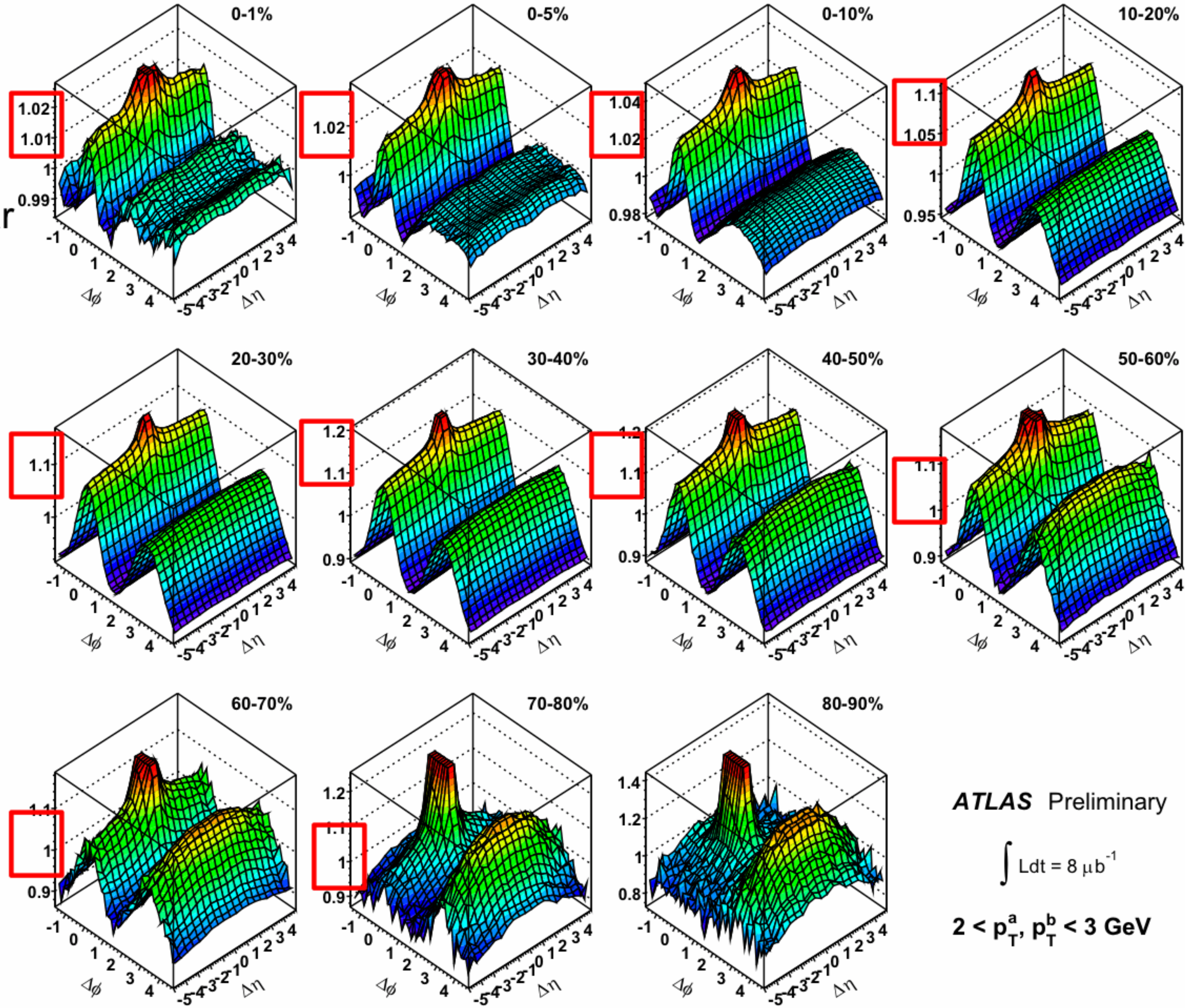
Rise and fall of "ridge/cone"—Centrality evolution

Pay attention to how long-range structures disappear and clear jet-related peaks emerge on the away-side

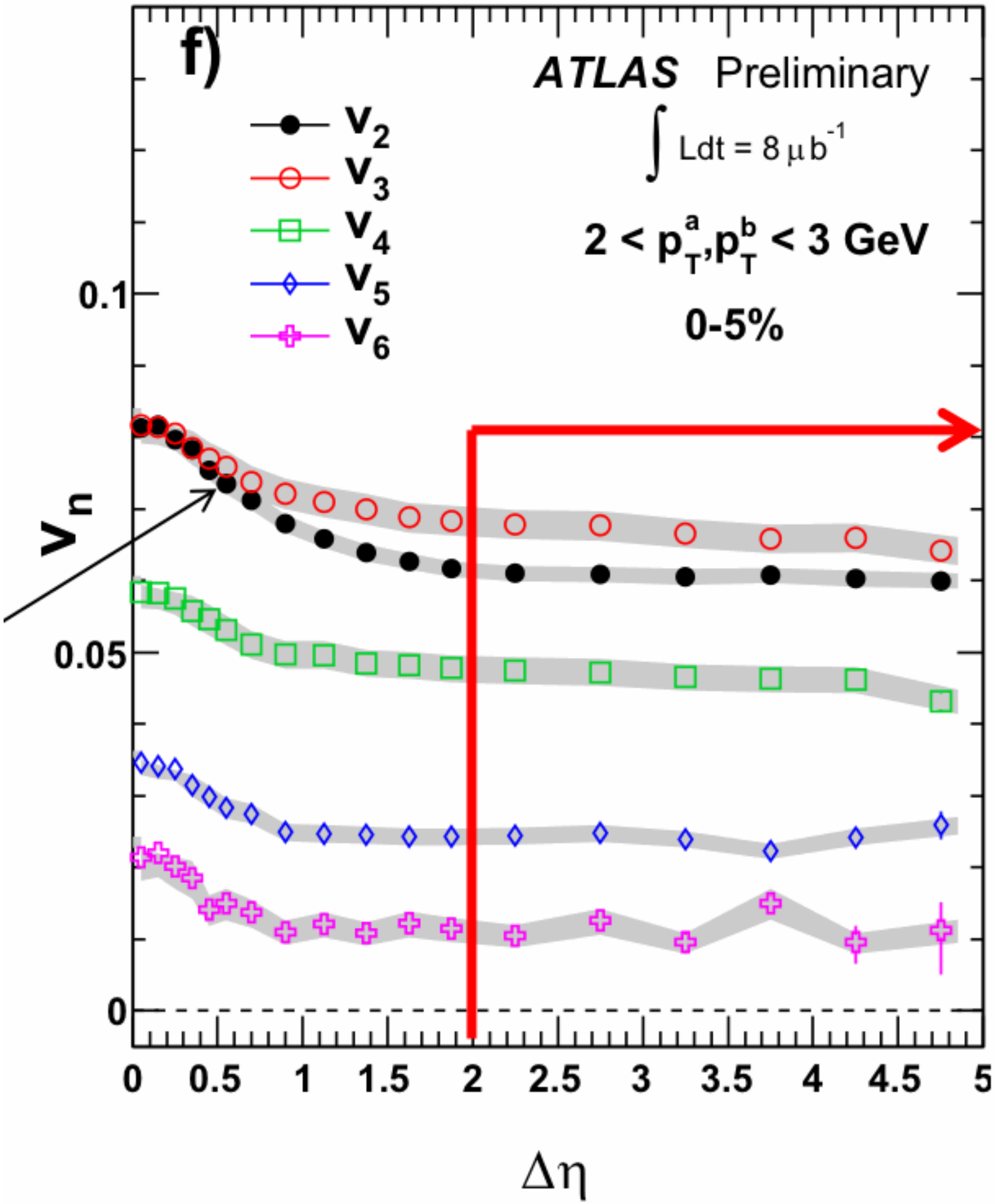
Strength of soft component increase and then decrease

Near-side jet peak is truncated from top to better reveal long range structure

LHC-ATLAS
Flow plenary
Jiangyong Jia

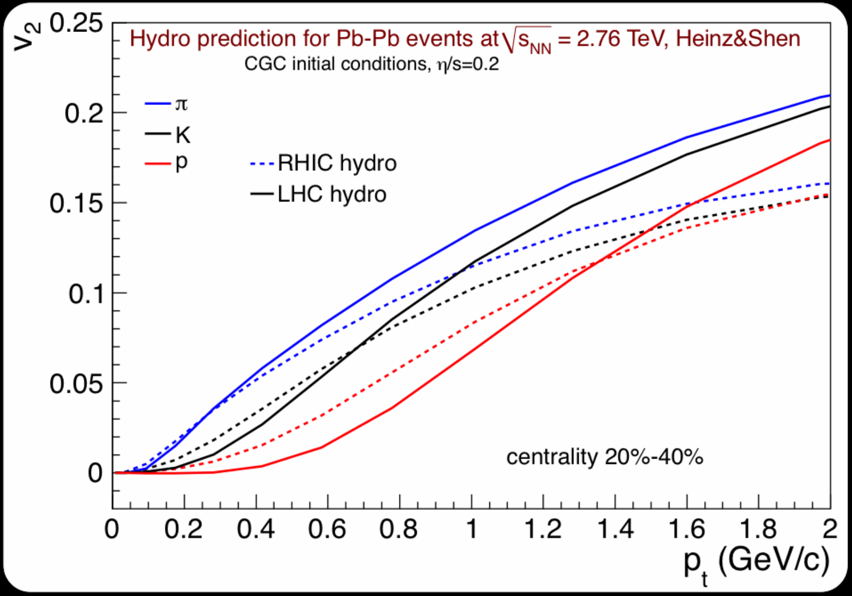


LHC-ATLAS
Flow plenary
Jiangyong Jia



v_2 for identified particles

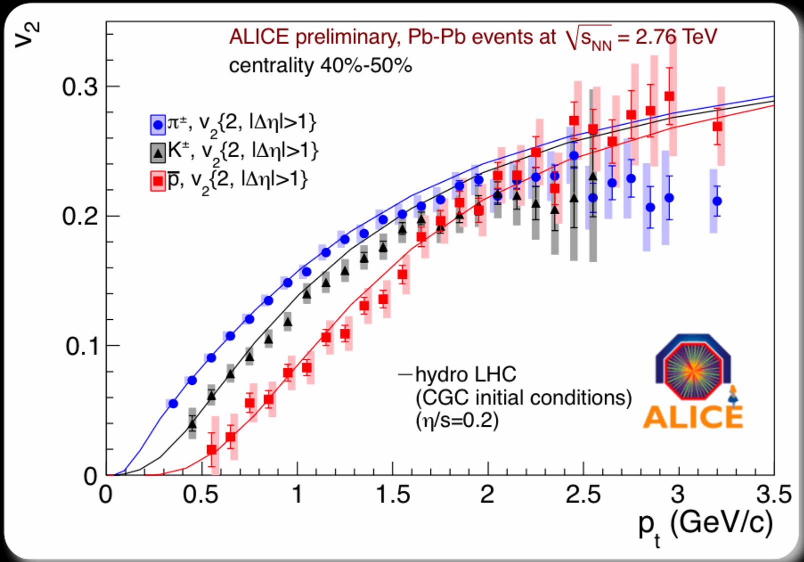
Hydro: Shen, Heinz, Huovinen & Song, arXiv:1105.3226

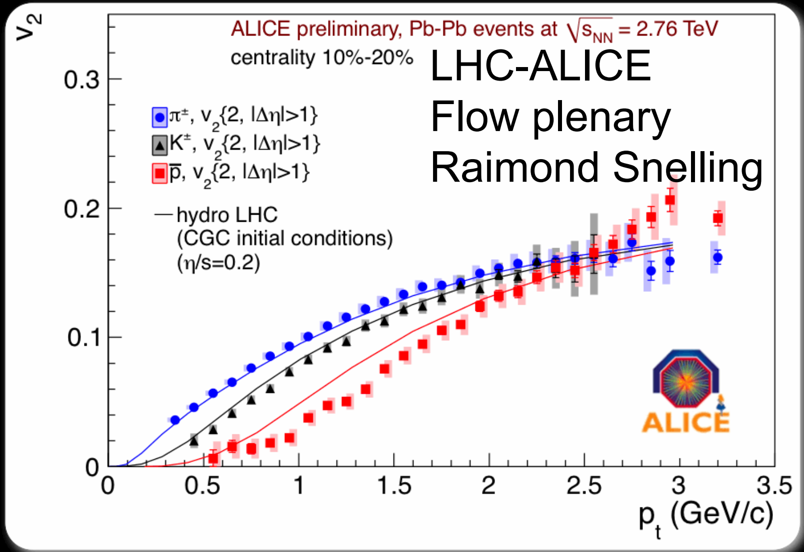


hydro models predict larger mass splitting
data shows mass splitting and agrees well with hydro predictions for mid-central collisions
for more central collisions the anti-proton flow is not described by the same calculations

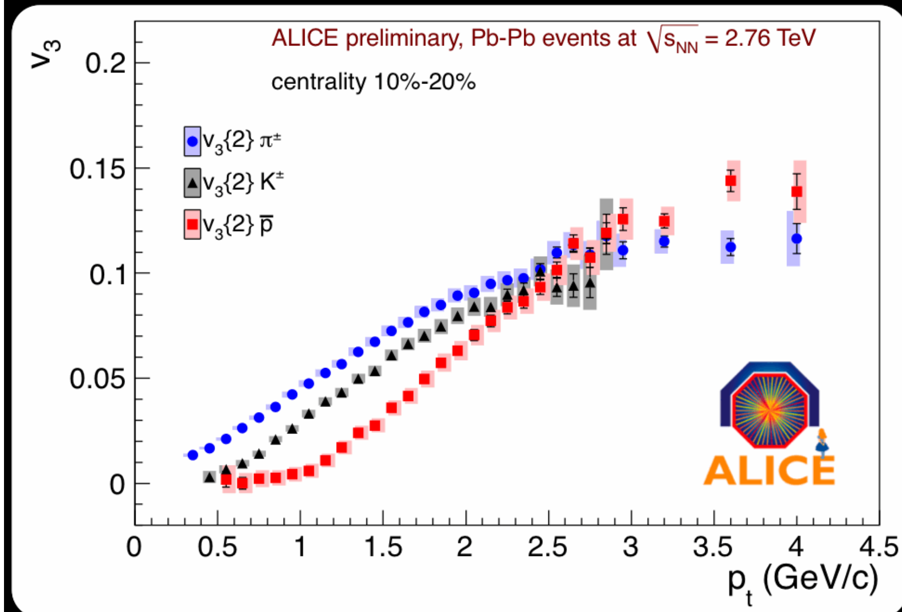
see presentation M. Krzewicki 14

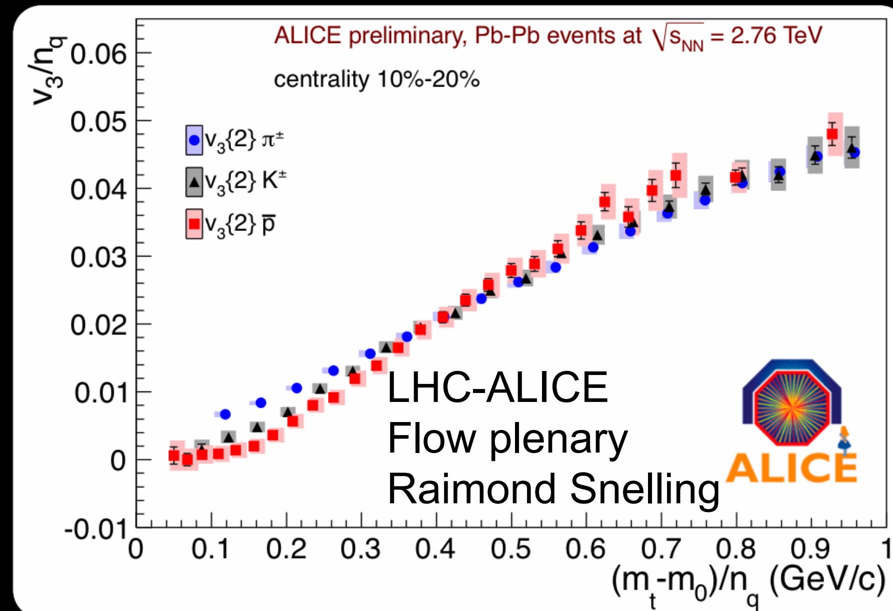
Hydro: Shen, Heinz, Huovinen & Song, arXiv:1105.3226





Triangular Flow

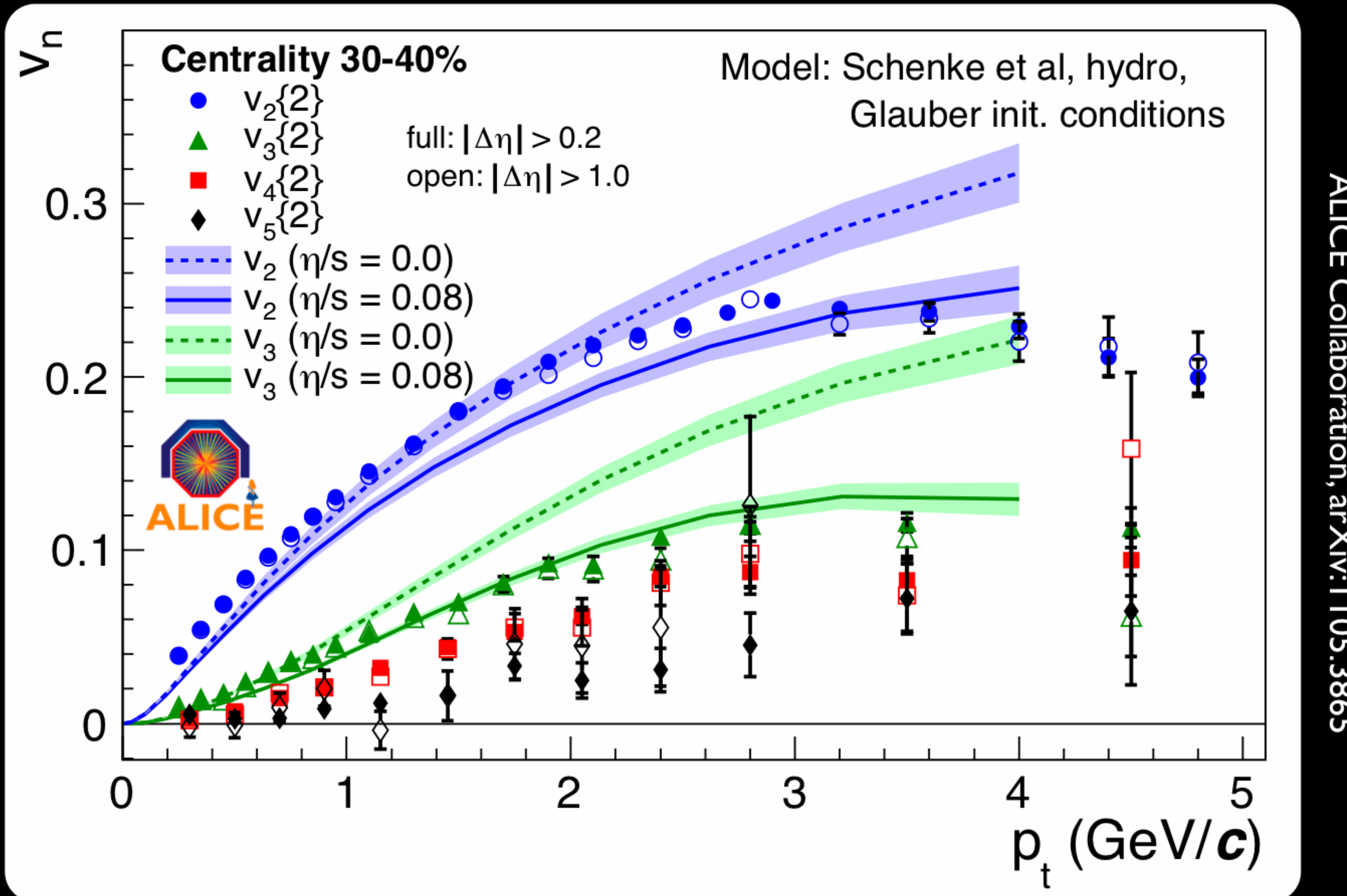




see presentation M. Krzewicki

The behavior of v_3 as function of p_t for pions, Kaons and protons shows the same features as we already observed for v_2

(we observe the mass splitting and, in addition, the crossing of the pions with protons at intermediate p_t, which for v_2 was considered as a signature for coalescence/recombination)

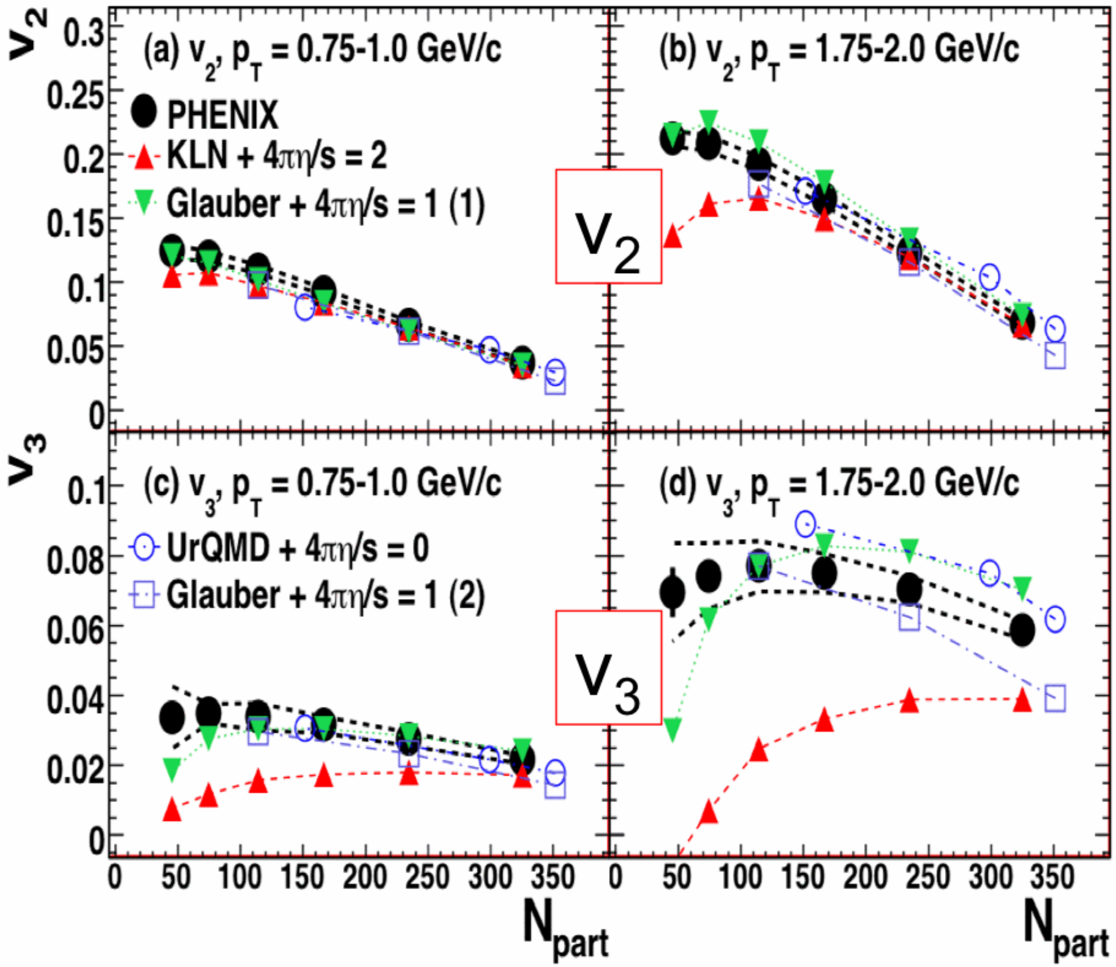


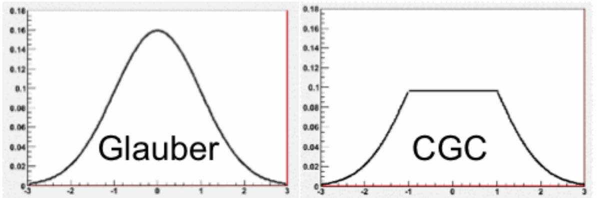
see presentation A. Bilandzic

LHC-ALICE, Flow plenary
Raimond Snelling

v_3 breaks the degeneracy

arXiv:1105.3928





Smaller eccentricity

Larger eccentricity

v_3 provides an additional constraining power on the hydro-model.

Glauber & $4\pi\eta/s=1$ *works*

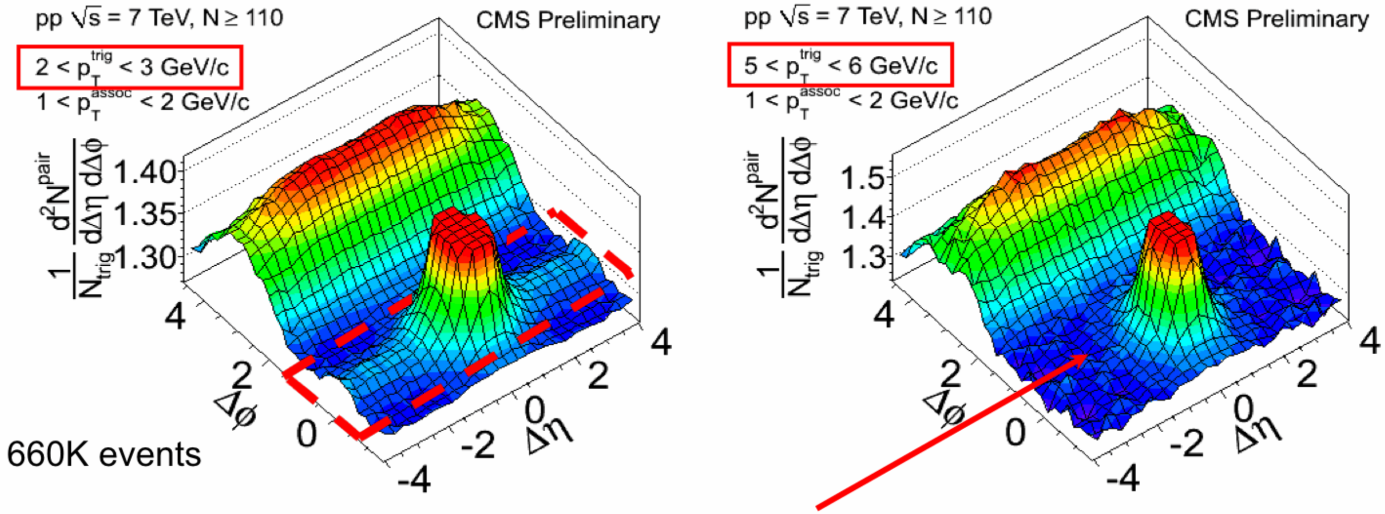
CGC-KLN & $4\pi\eta/s=2$ *fails*

B. Alver et. al., Phys. Rev. C82, 034913(2010).
B. Schenke et. al., Phys. Rev. Lett. 106, 042301(2011).
H. Petersen et. al., Phys. Rev. C82, 041901(2010).

Glauber & $4\pi\eta/s=1$ favored

RHIC-PHENIX
Flow plenary
S.E.

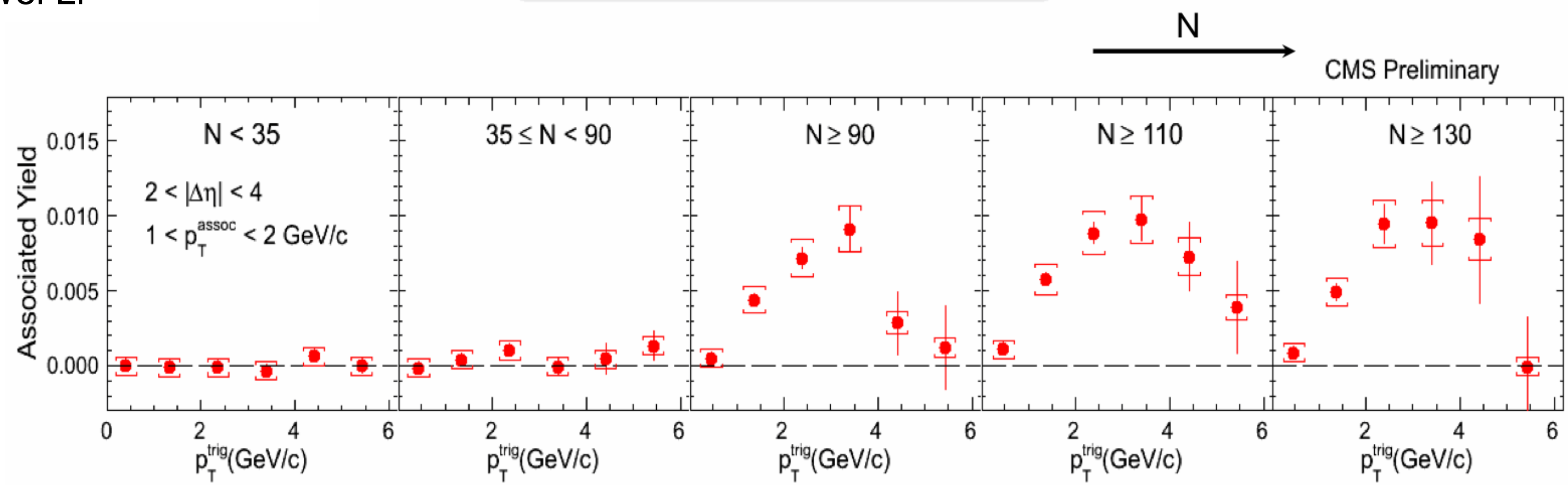
100 billion (1.78 pb^{-1}) sampled minimum bias events from high-multiplicity trigger



No ridge when correlating to high p_T particles!

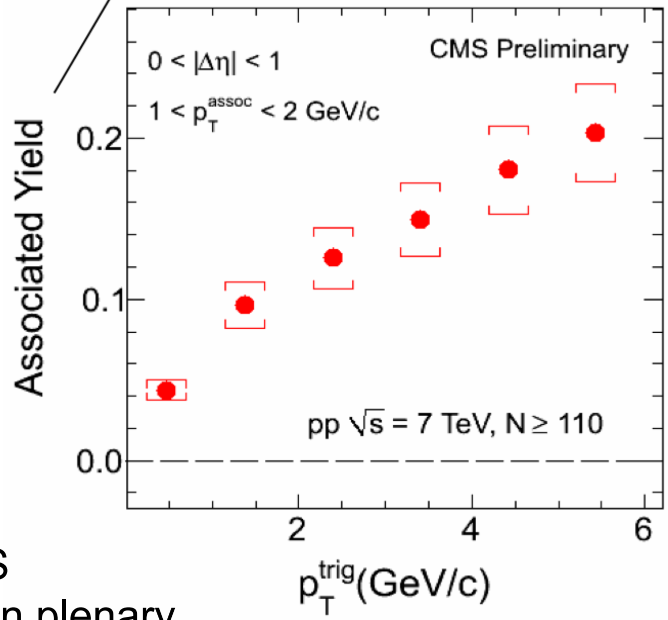
LHC-CMS
Correlation plenary
Wei Li

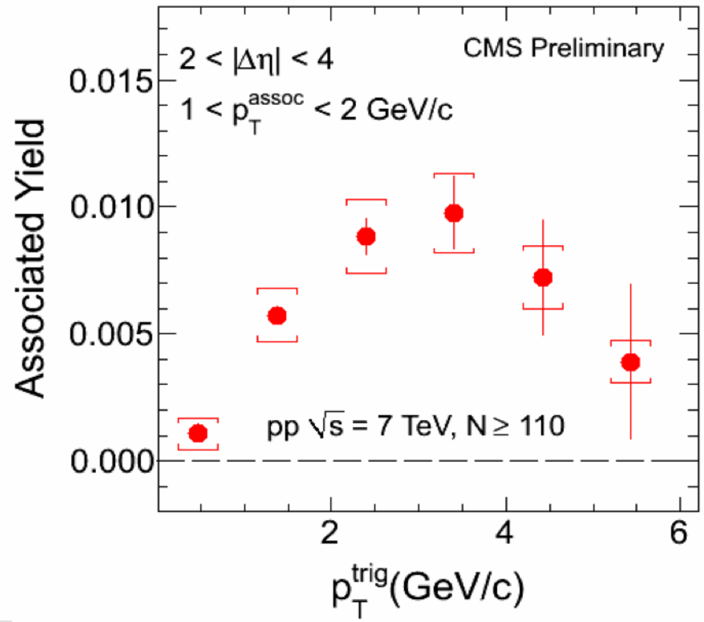
Ridge region (2<|Δη|<4)



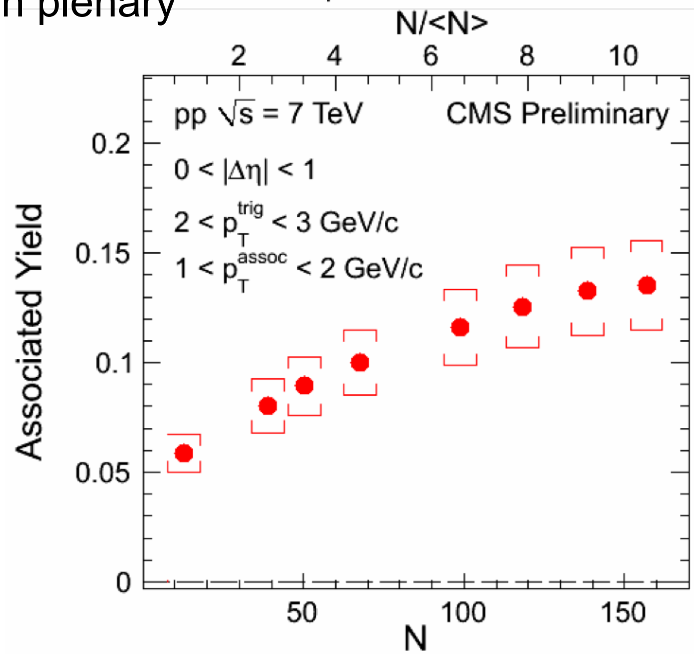
Jet region (|Δη|<1)

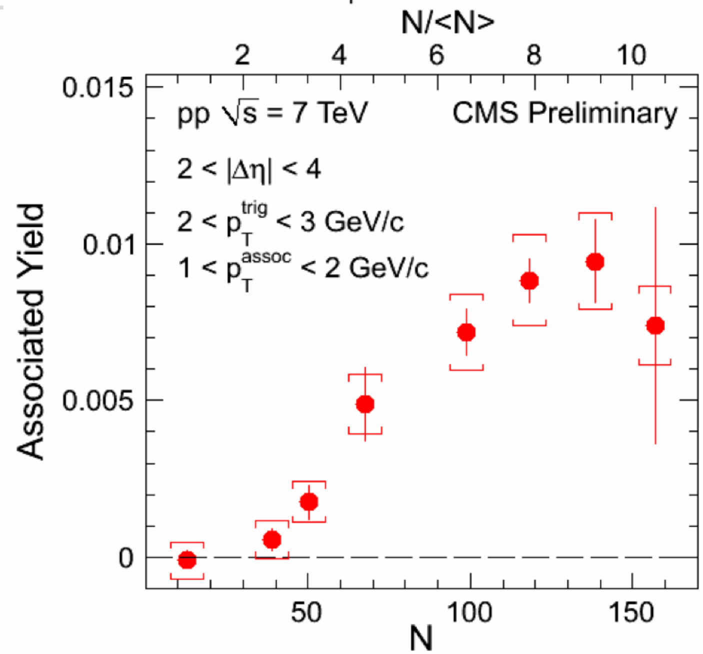
Ridge region (2<|Δη|<4)





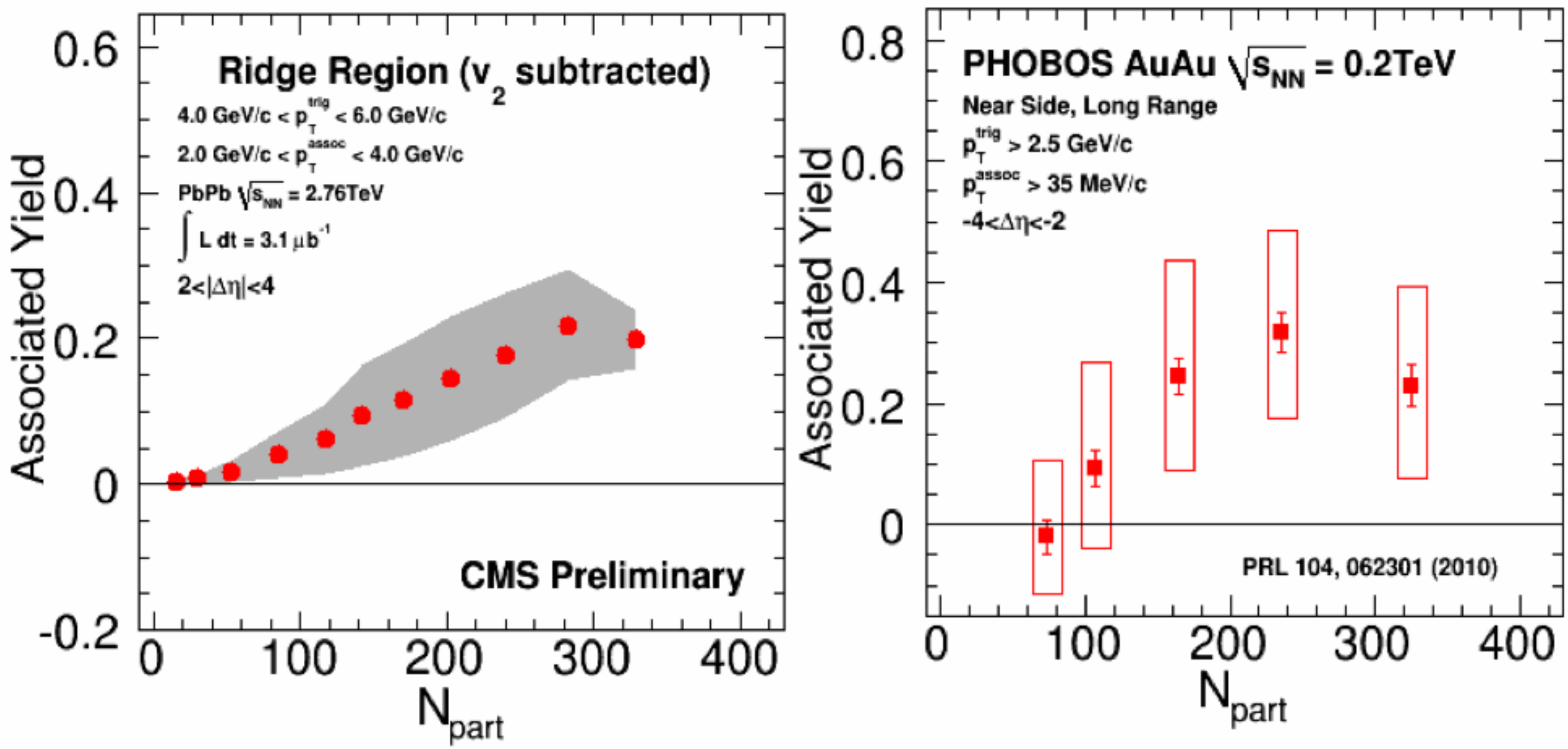
LHC-CMS
Correlation plenary
Wei Li





LHC-CMS
Correlation plenary
Wei Li

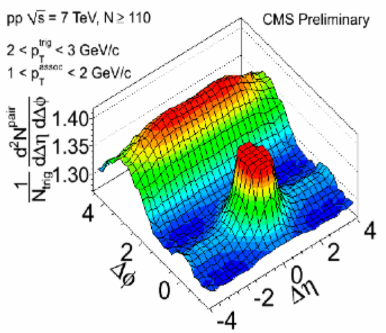
Ridge region (2<|Δη|<4)



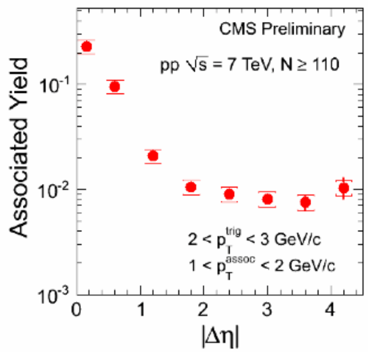
Please do not compare the magnitude, look at the shape only,
(because of different pT selections)

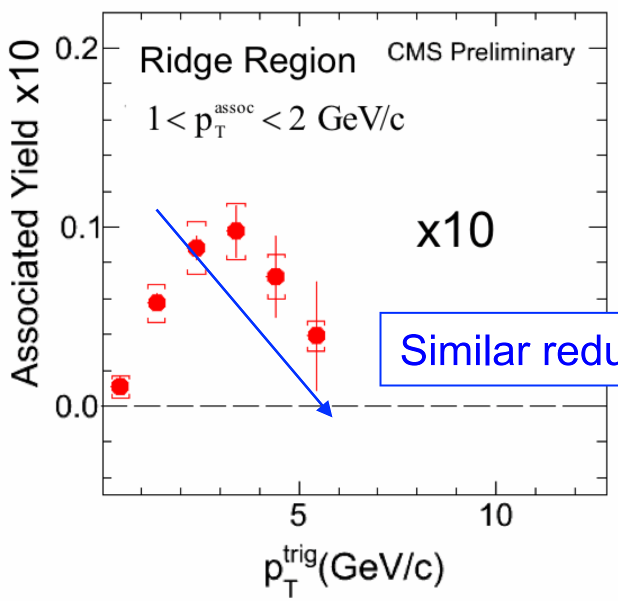
Ridge in pp and PbPb

CMS pp 7 TeV, N ≥ 110

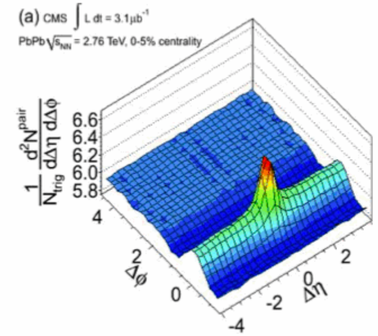


|Δη| dependence

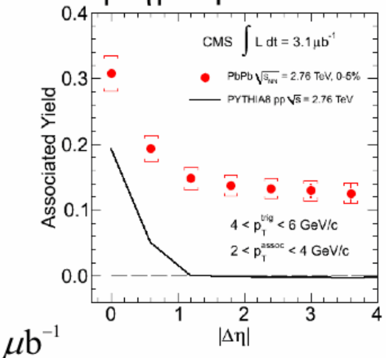




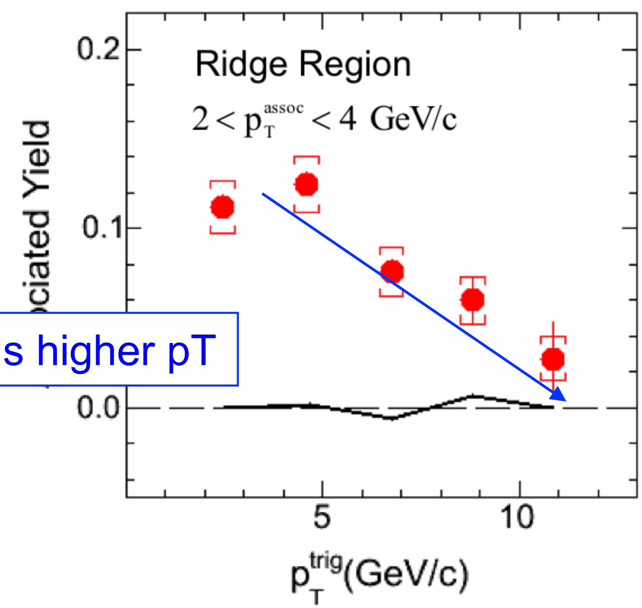
CMS PbPb 2.76 TeV, 0-5%



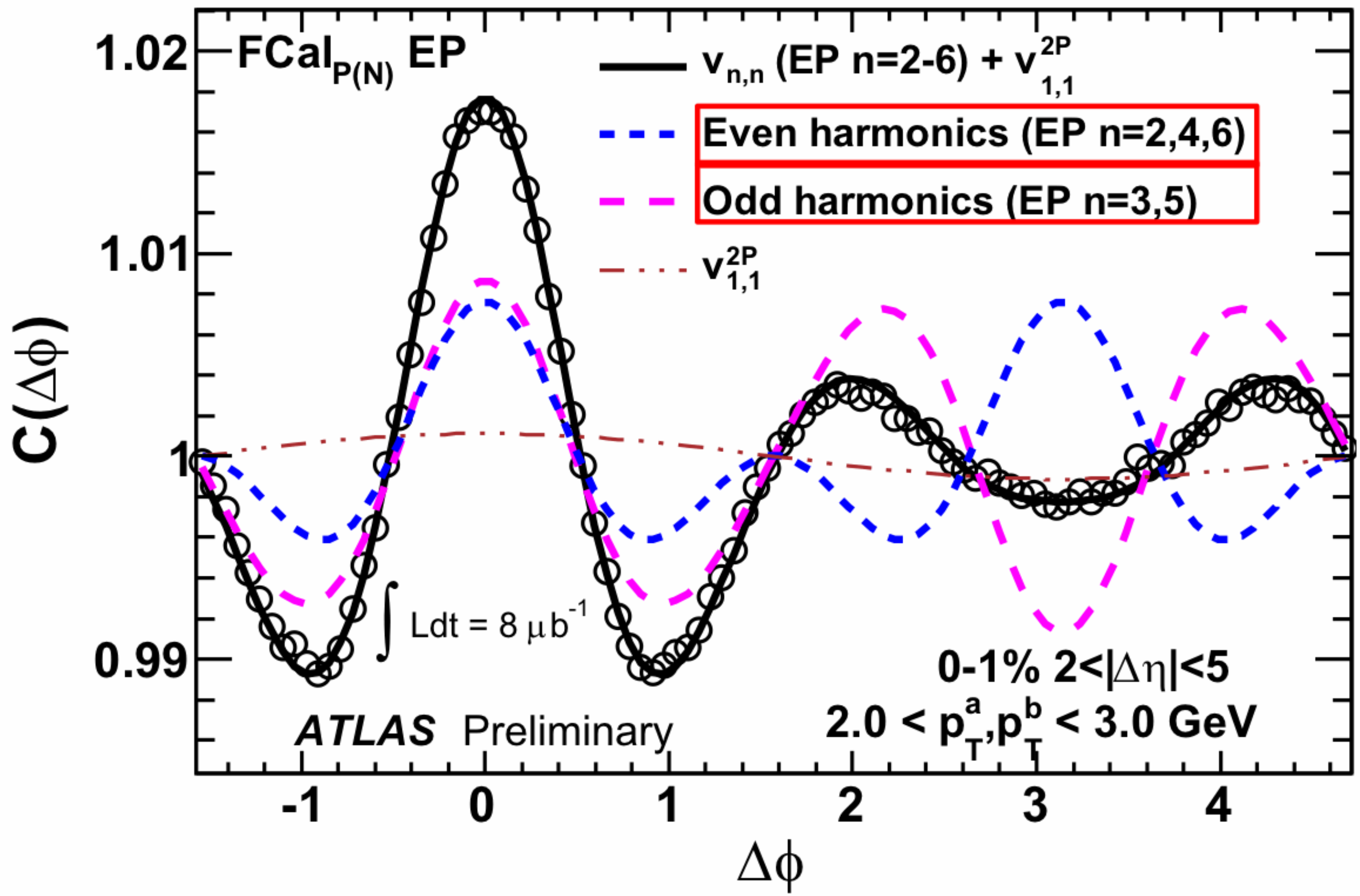
|Δη| dependence



CMS $\int L = 3.1\ \mu b^{-1}$

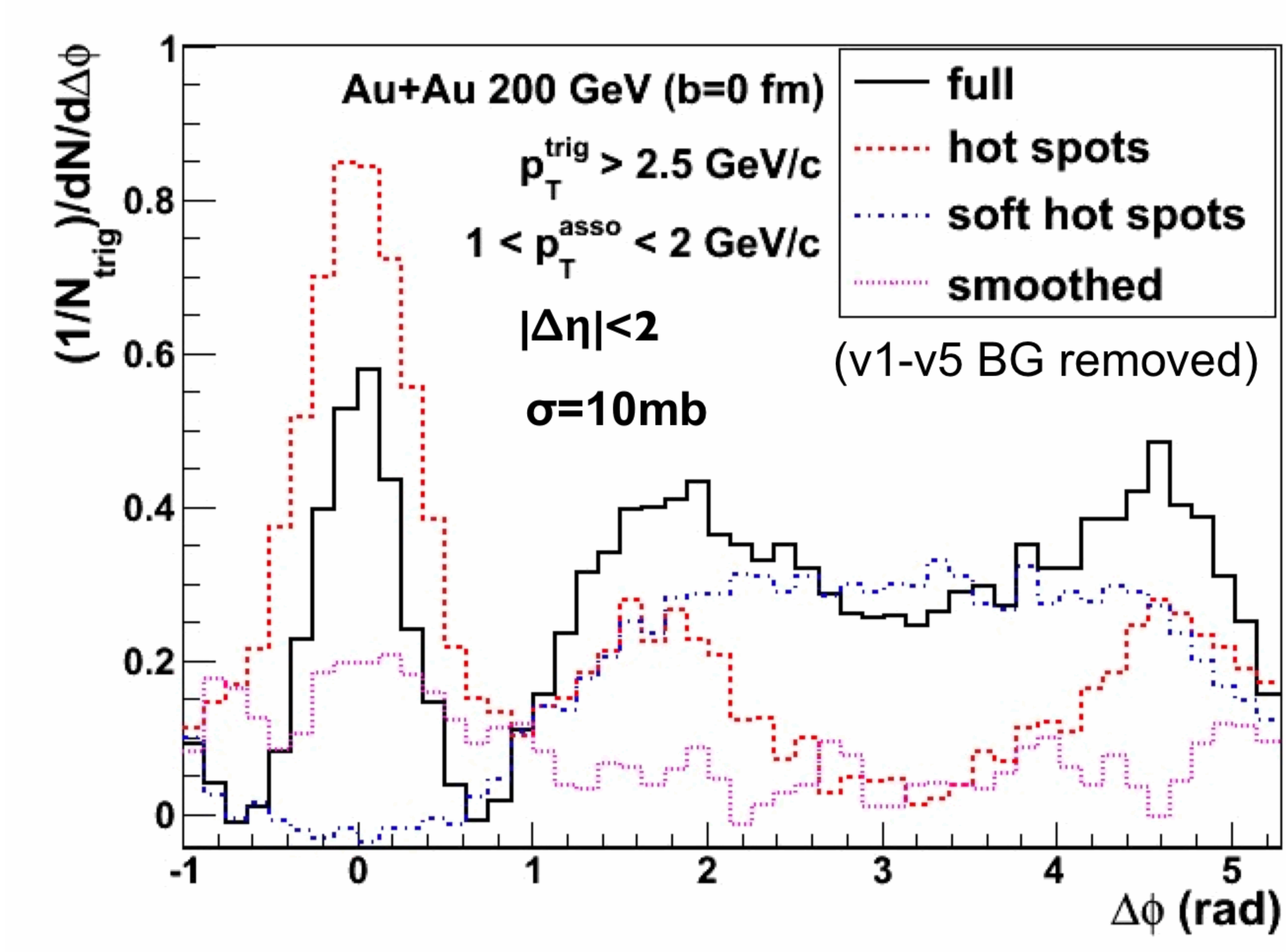


Similar reduction towards higher pT



LHC-ATLAS
Flow plenary
Jiangyong Jia

$v_n\{\Phi_n\}$ with η gap ~ $v_n\{2\text{-part}\}$ with η gap
This should agree with each other, therefore
this does not rule out jet-modification with η gap.



AMPT simulation study
Guo-Liang Ma

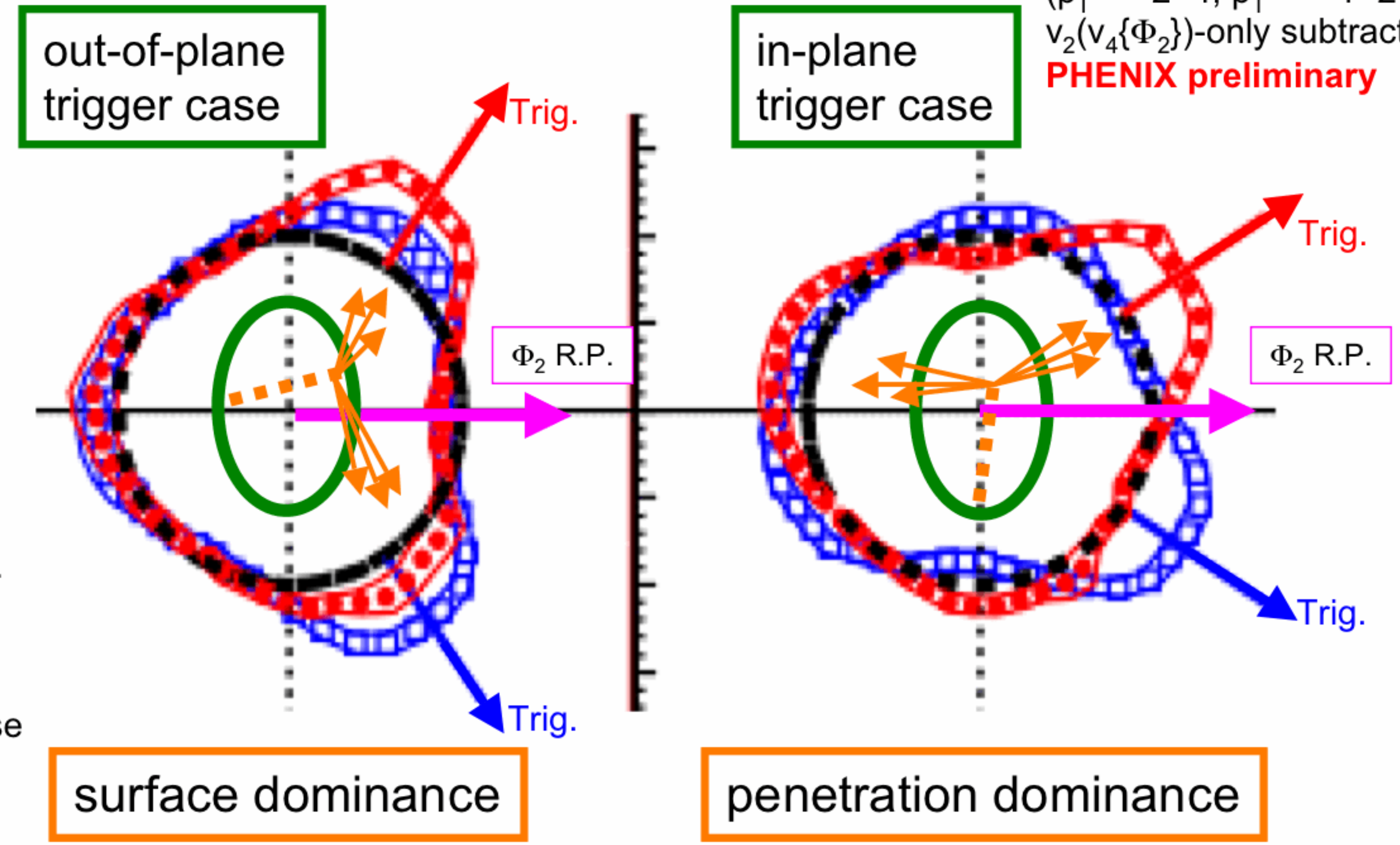
Observed left/right asymmetry remains after “the usual/normal” v_3 subtraction.

Trigger angle selection w.r.t. Φ_2 separately for left(up) / right(down)

Trigger angle selected 2-part. corr. data are plotted in polar coordinate by rotating Φ_2 R.P. angle as X-axis.

Flow subtracted yield is shown radially with base line. ▪▪▪▪▪▪

200GeV Au+Au -> h-h
(p_T^{Trig}=2~4, p_T^{Asso}=1~2GeV/c)
$v_2(v_4\{\Phi_2\})$-only subtraction
PHENIX preliminary



RHIC-PHENIX
Flow plenary
S.E.

Two competing processes seen