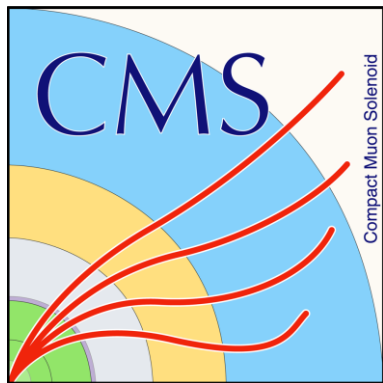


New results from CMS

Yen-Jie Lee (MIT)

For the CMS collaboration



Quark Matter 2015

Kobe, Japan

27 Sep - 3 Oct, 2015



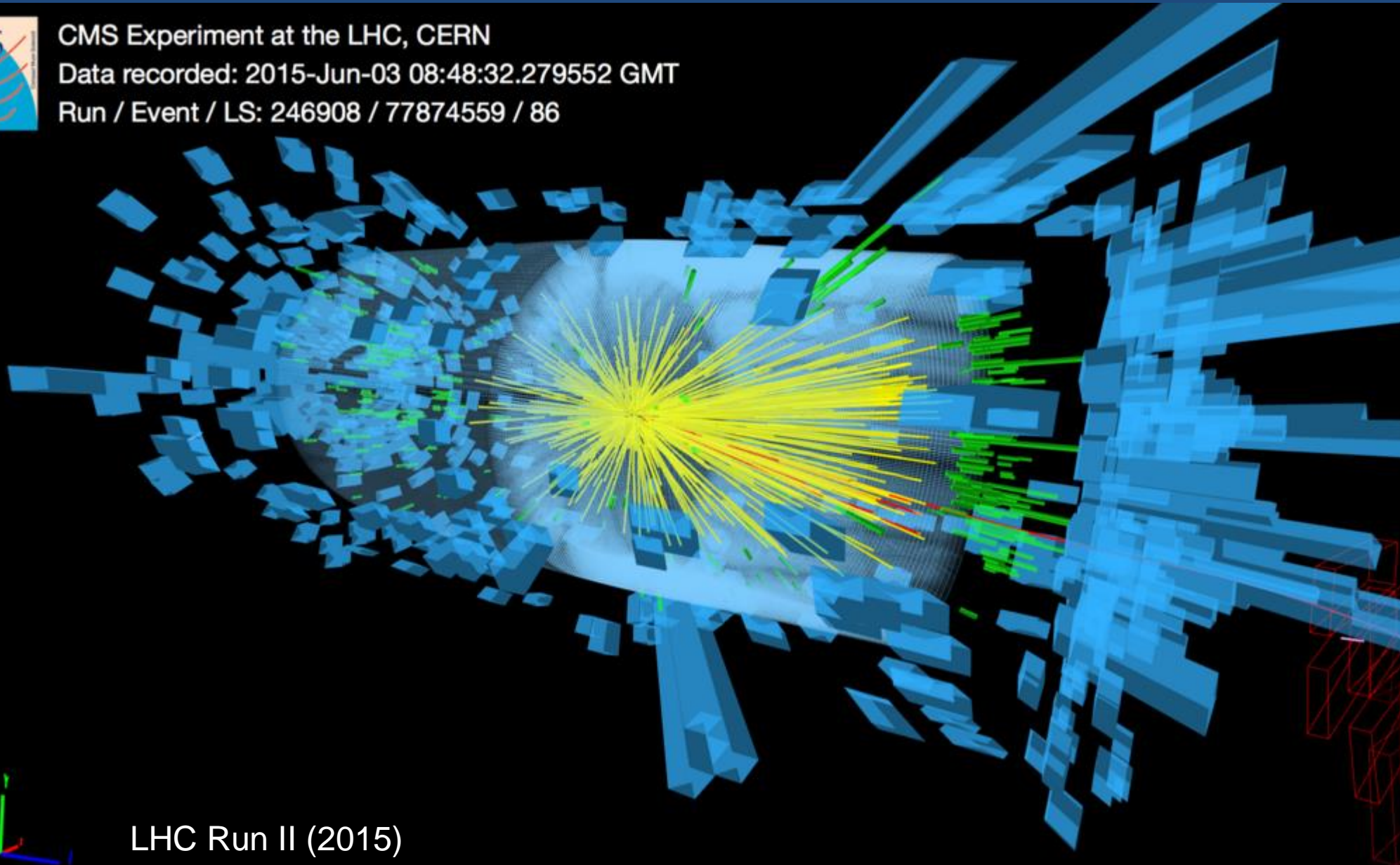
pp Collisions at 13 TeV



CMS Experiment at the LHC, CERN

Data recorded: 2015-Jun-03 08:48:32.279552 GMT

Run / Event / LS: 246908 / 77874559 / 86



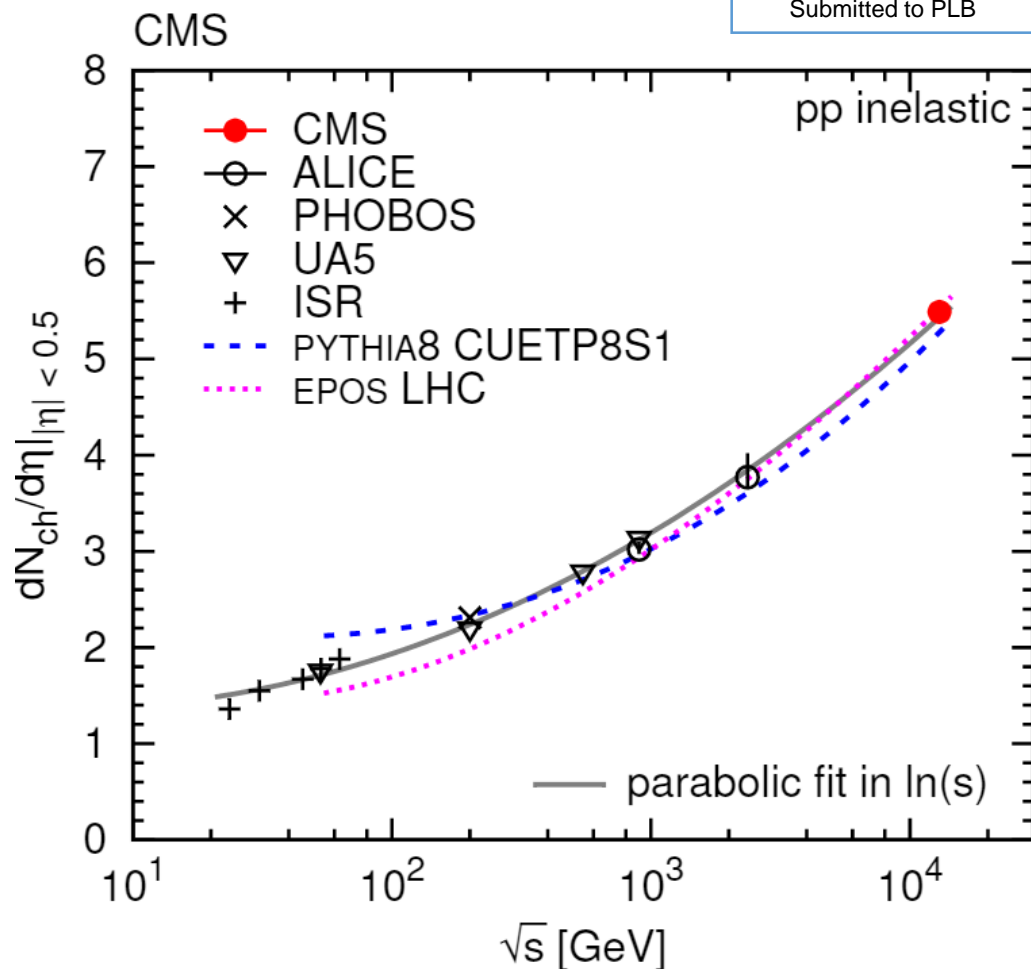
LHC Run II (2015)



Global Event Properties

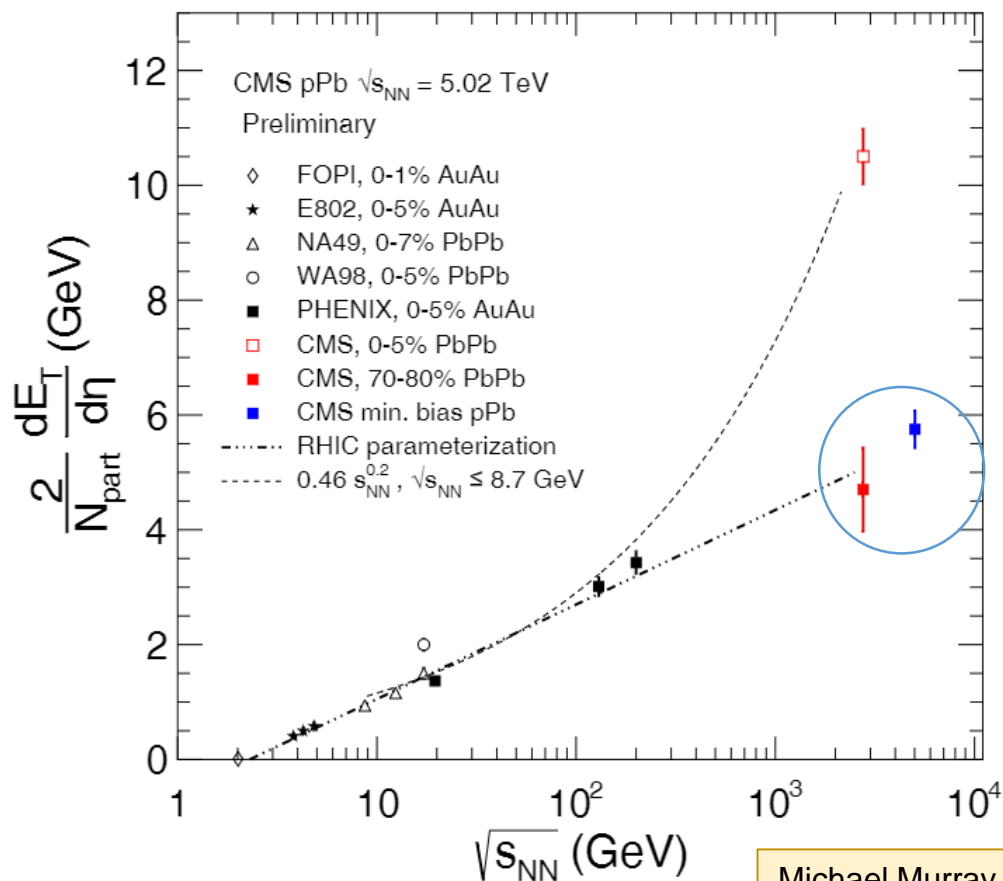
Inelastic $dN_{ch}/d\eta$ in **pp** at 13 TeV

arXiv 1507.05915
Submitted to PLB



$dE_T/d\eta$ in **pPb** at 5.02 TeV

CMS-PAS-HIN-14-014



Michael Murray

NEW

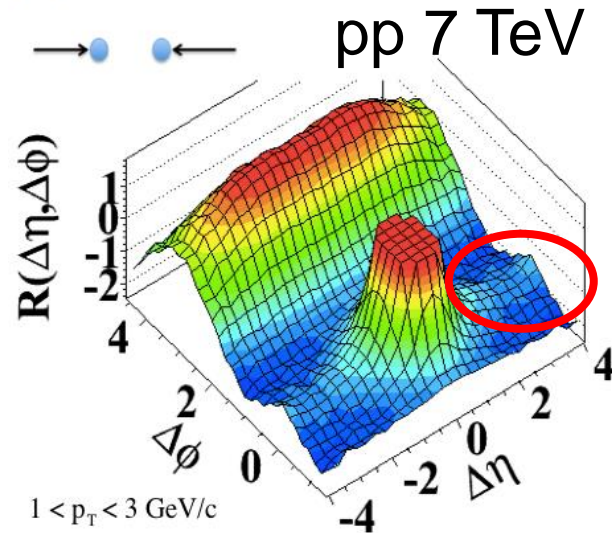
The First LHC Run II paper!

NEW

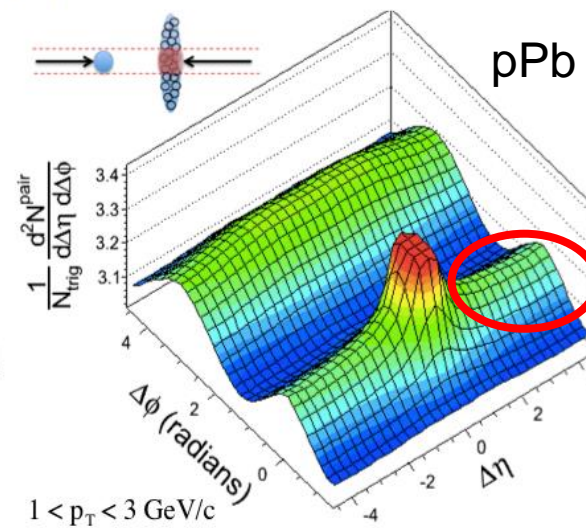
Energy density per participant in pPb similar to **70-80% PbPb at 2.76 TeV**

Ridge in pp, pPb and PbPb

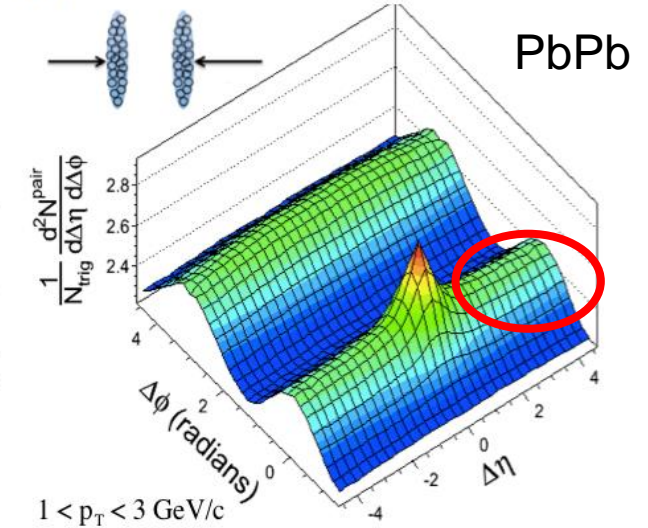
(a) pp $\sqrt{s} = 7$ TeV, $N_{\text{trk}}^{\text{offline}} \geq 110$



(b) pPb $\sqrt{s_{\text{NN}}} = 5.02$ TeV, $220 < N_{\text{trk}}^{\text{offline}} \leq 260$



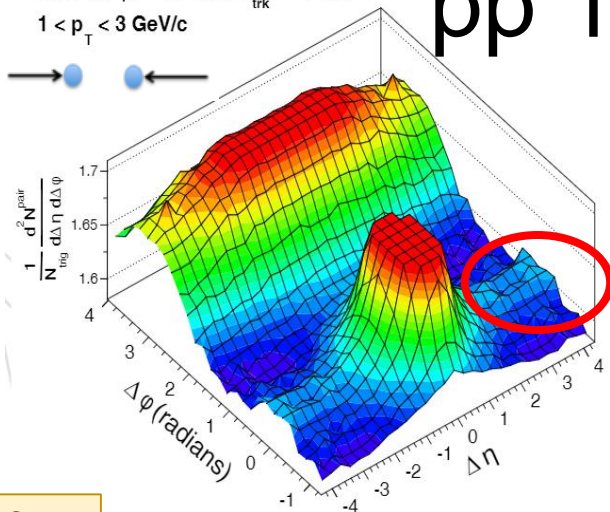
(c) PbPb $\sqrt{s_{\text{NN}}} = 2.76$ TeV, $220 < N_{\text{trk}}^{\text{offline}} \leq 260$



NEW

CMS pp $\sqrt{s} = 13$ TeV, $N_{\text{trk}}^{\text{offline}} \geq 105$
 $1 < p_T < 3$ GeV/c

pp 13 TeV



Ridge observed in high multiplicity pp collisions at **13 TeV**!



13 TeV vs. 7 TeV?

Zhenyu Chen

CMS-FSQ-15-002

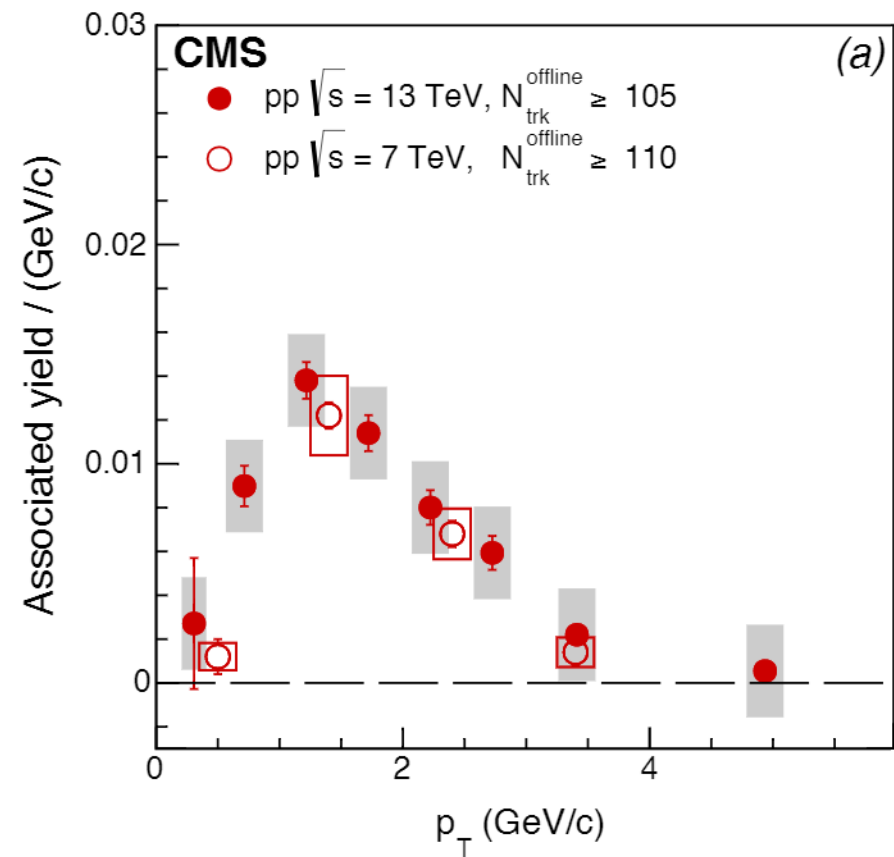
Ridge / Azimuthal Anisotropy in pp



pp at 7 and 13 TeV



CMS-FSQ-15-002



Ridge yields in 7 and 13 TeV pp are similar!

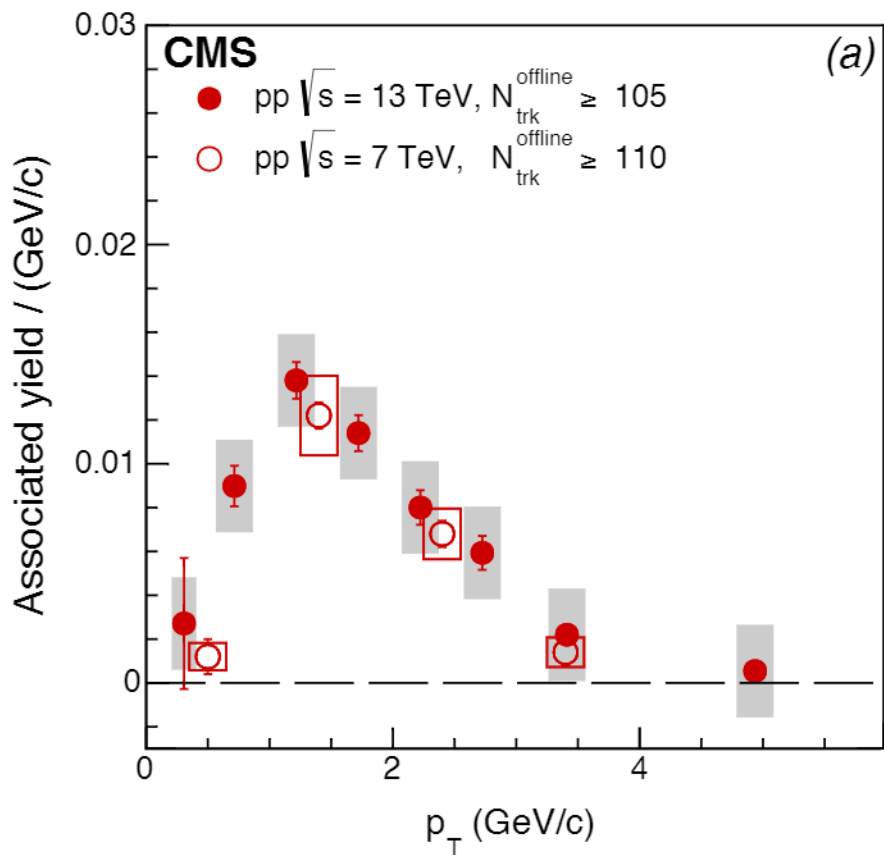
Ridge / Azimuthal Anisotropy in pp

NEW

pp at **7** and **13** TeV



CMS-FSQ-15-002



Ridge yields in **7** and **13** TeV pp are **similar**!

NEW

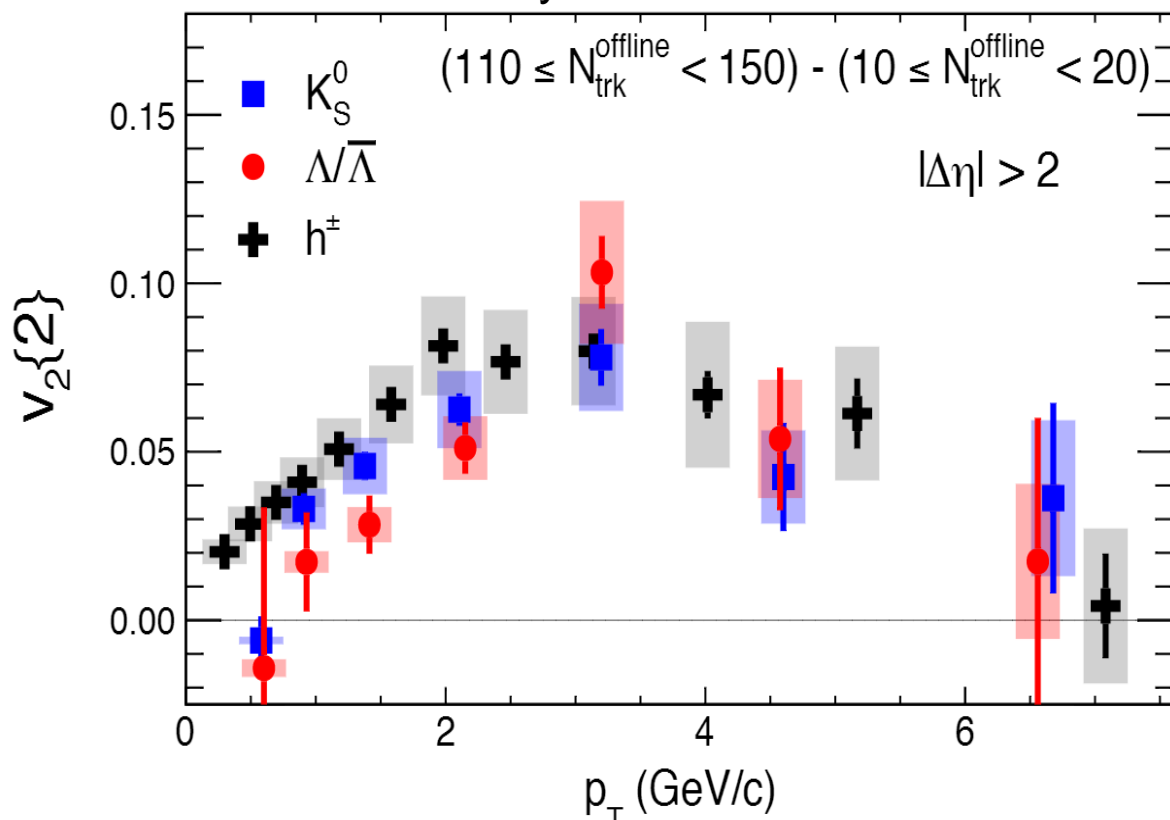
pp at **7** TeV

Zhenyu Chen

Maxime Guilbaud

CMS-PAS-HIN-15-009

CMS Preliminary



$v_2\{2\}$ of the **charged hadrons**, K_S , Λ

$v_3\{2\}$ and $c_2\{4\}$ are measured as well!

v_2 vs. η in pPb



Origin of the η dependence of v_2 {2} in pPb?

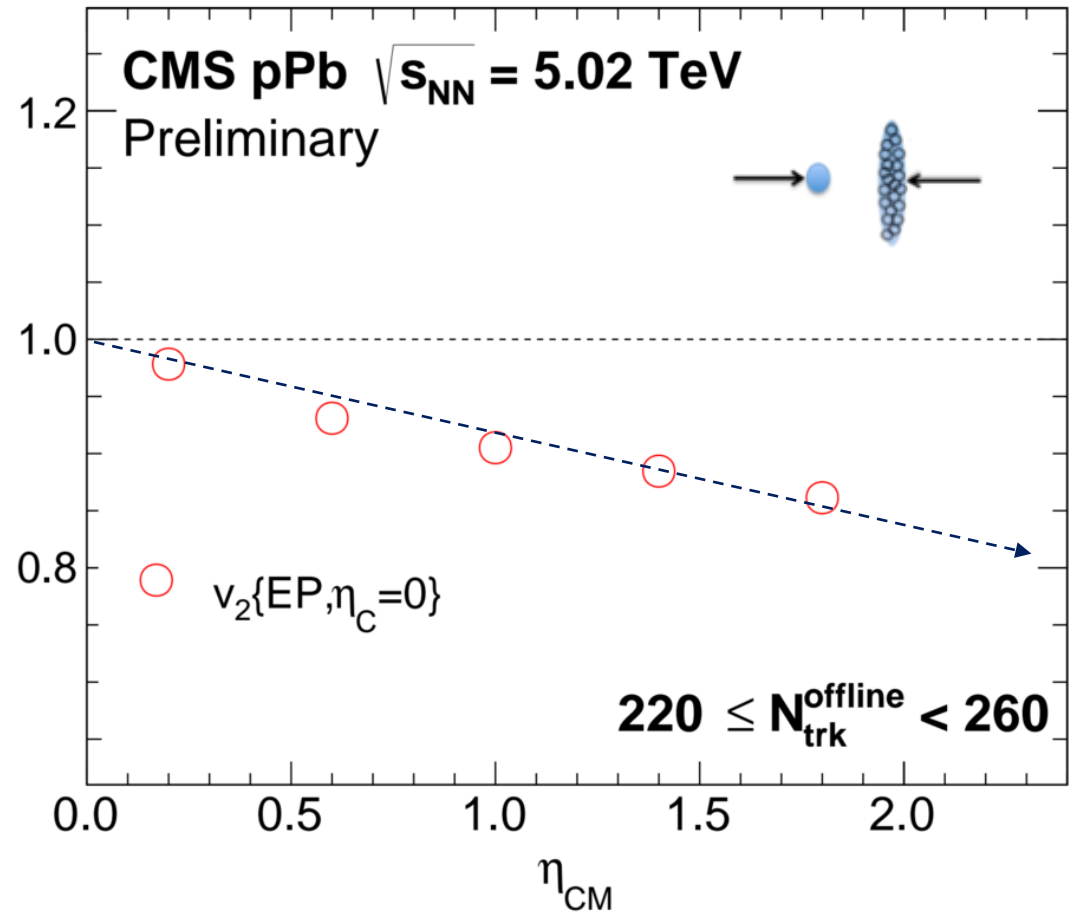
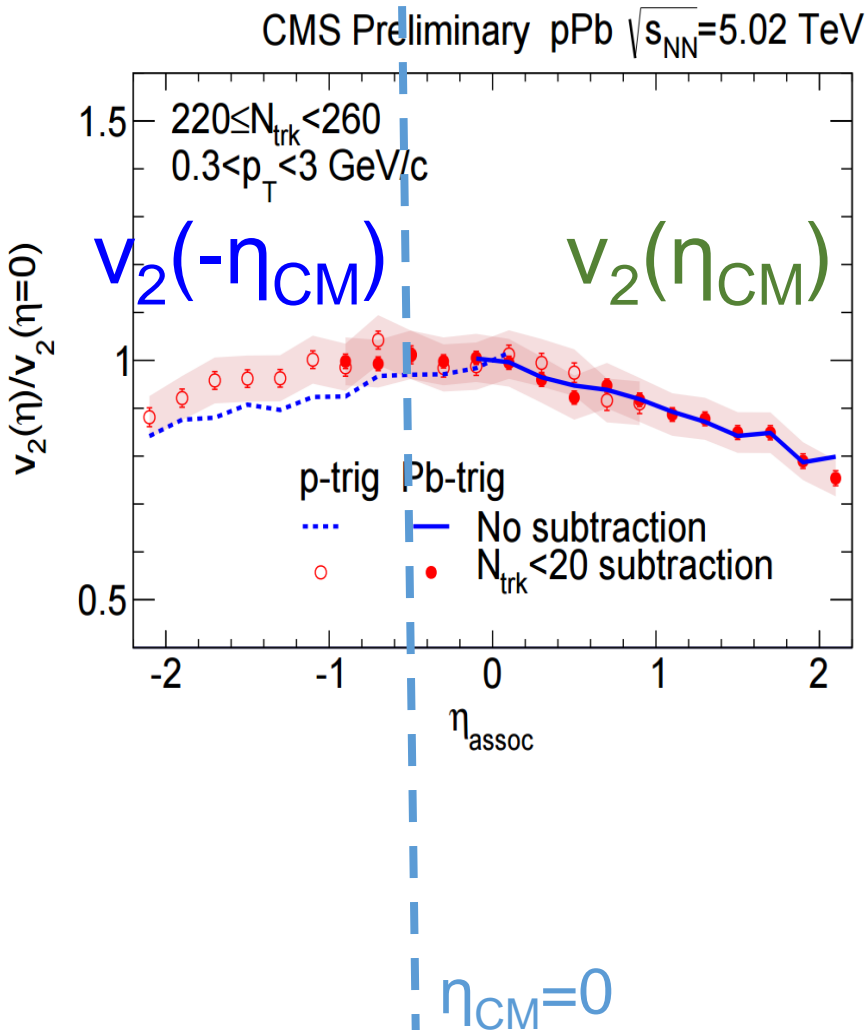
Quan Wang

CMS-PAS-HIN-15-008

CMS-PAS-HIN-14-008



$v_2(\eta_{CM}) / v_2(-\eta_{CM})$ vs. η_{CM}



Asymmetric v_2 magnitude

Event Plane Decorrelation in pPb

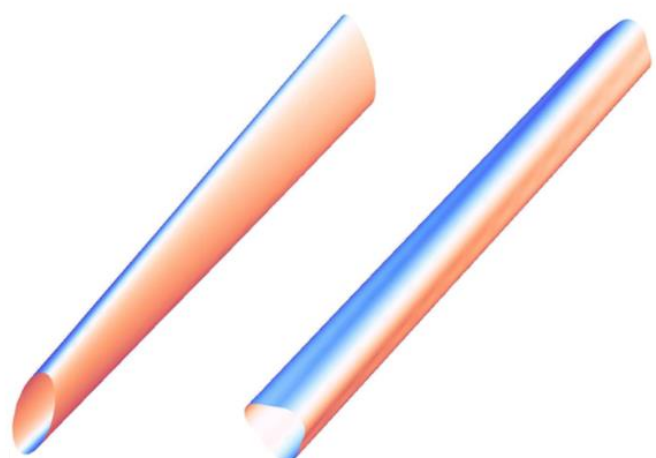
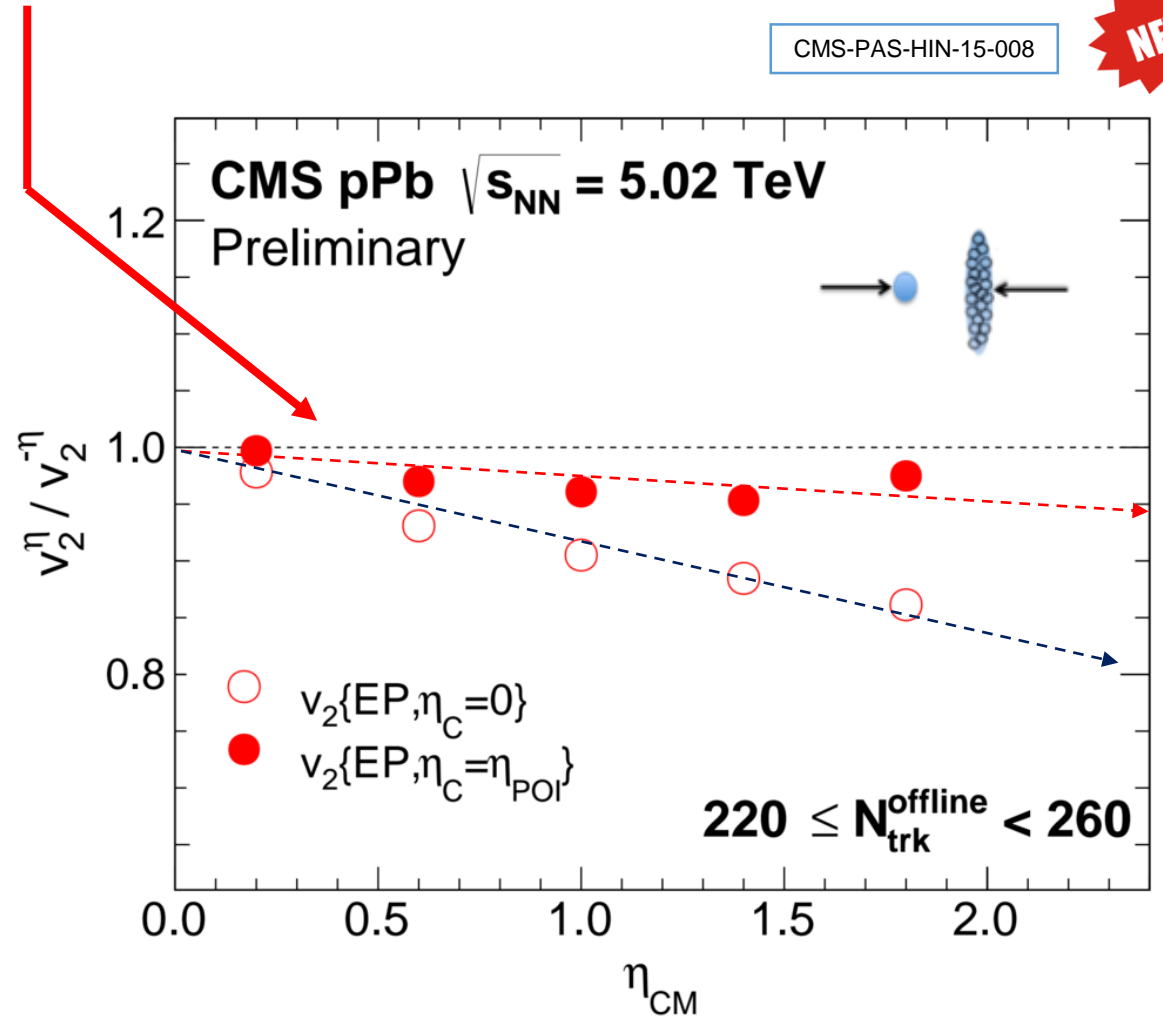
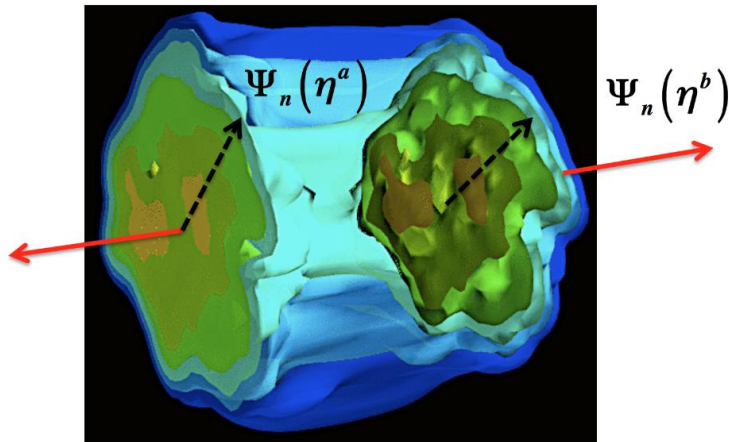


Origin of the η dependence of $v_2 \{2\}$ in pPb?

Quan Wang

If we correct the effects from event plane decorrelation

CMS-PAS-HIN-15-008



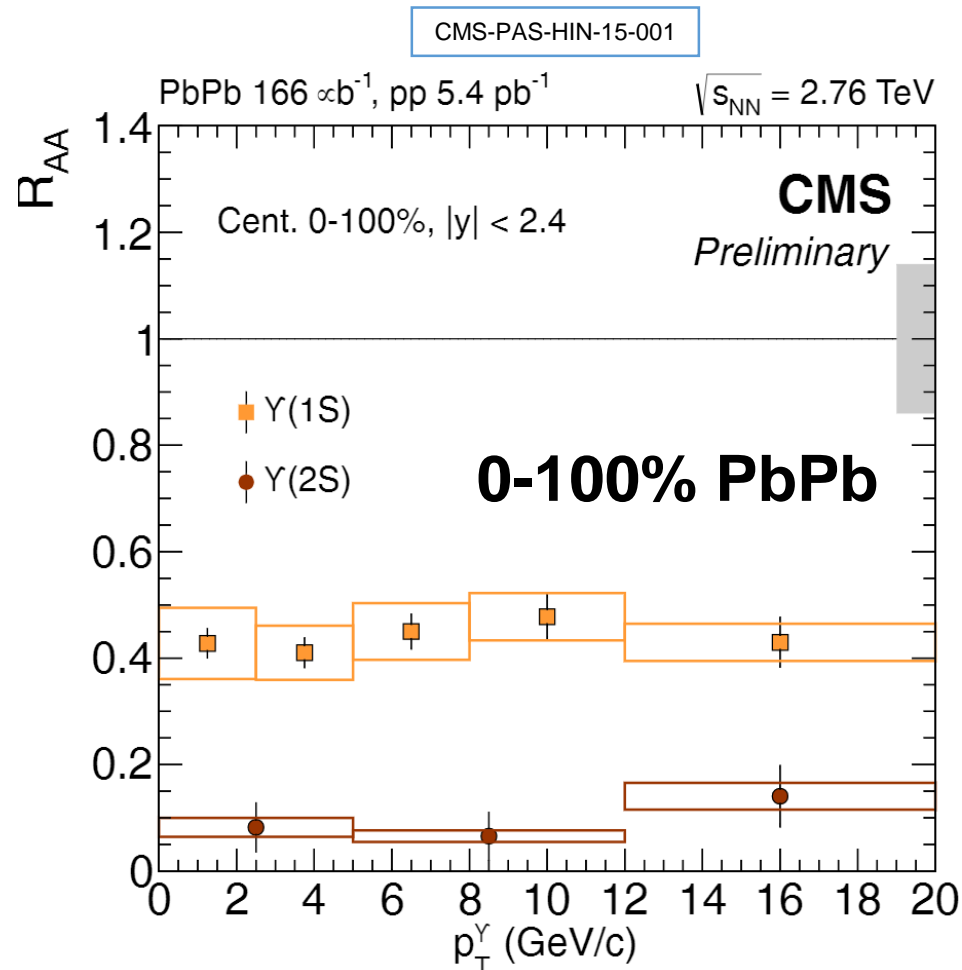
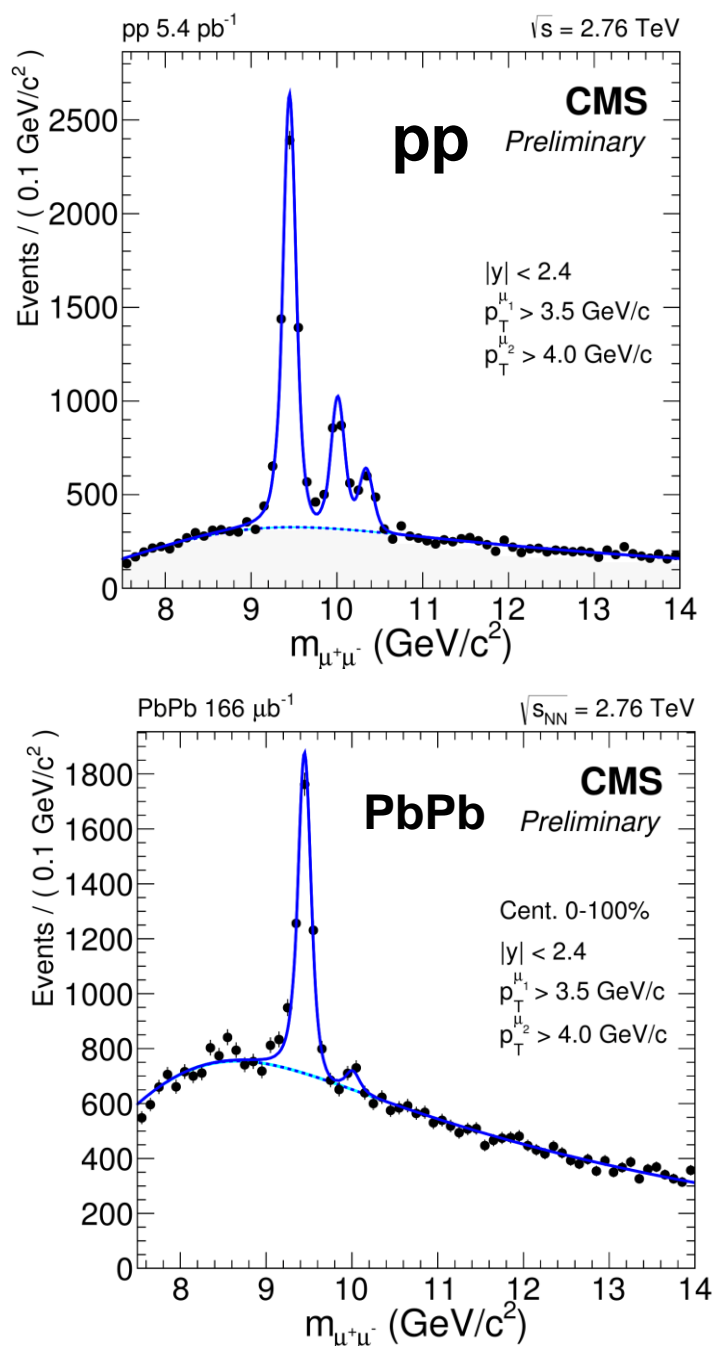
Bozek et al, PRC83 034911 (2011)

Asymmetric v_2 magnitude

Jovan Milosevic

Principle Component Analysis in pPb and PbPb are also presented

Upsilon Suppression in PbPb



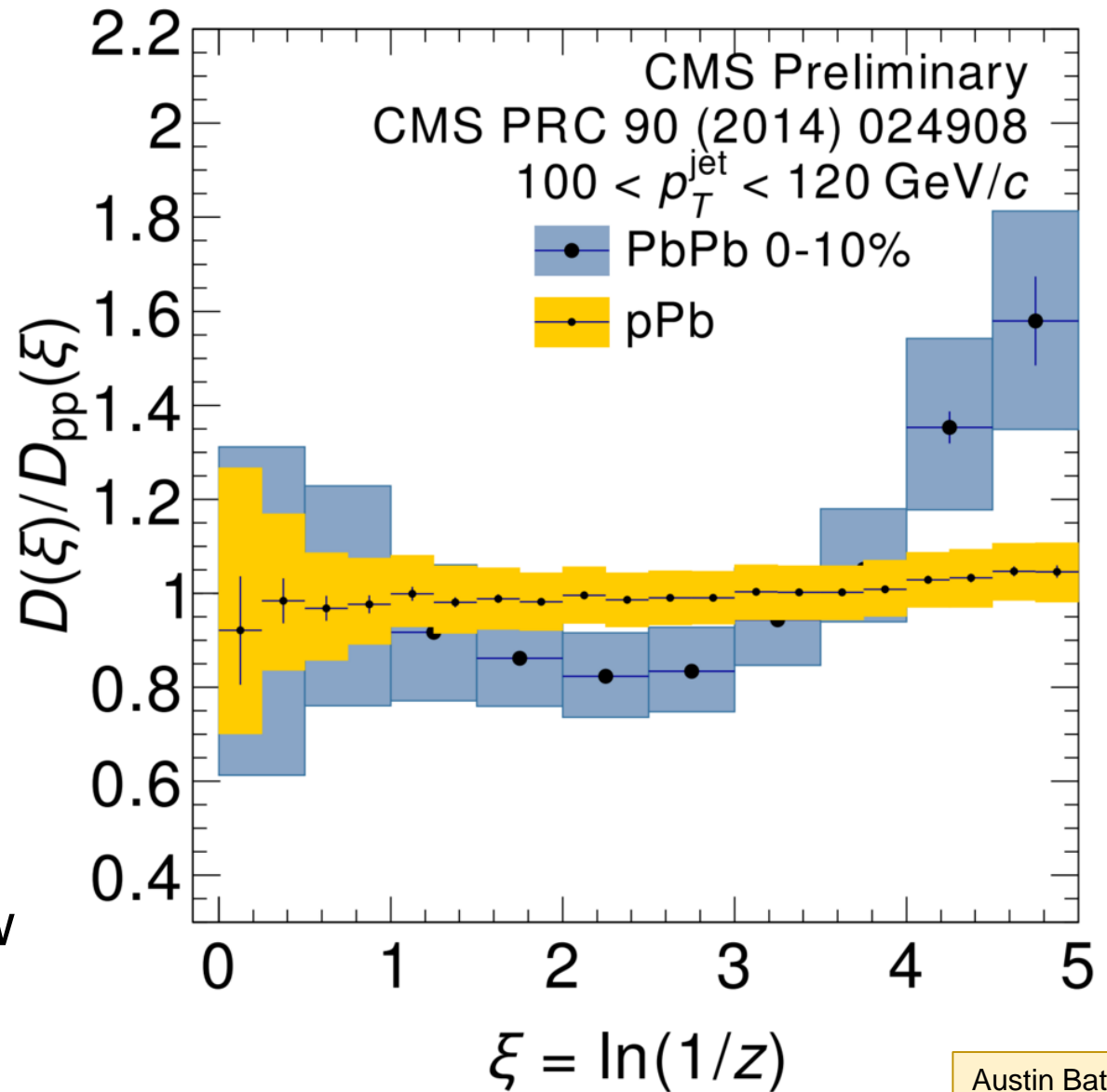
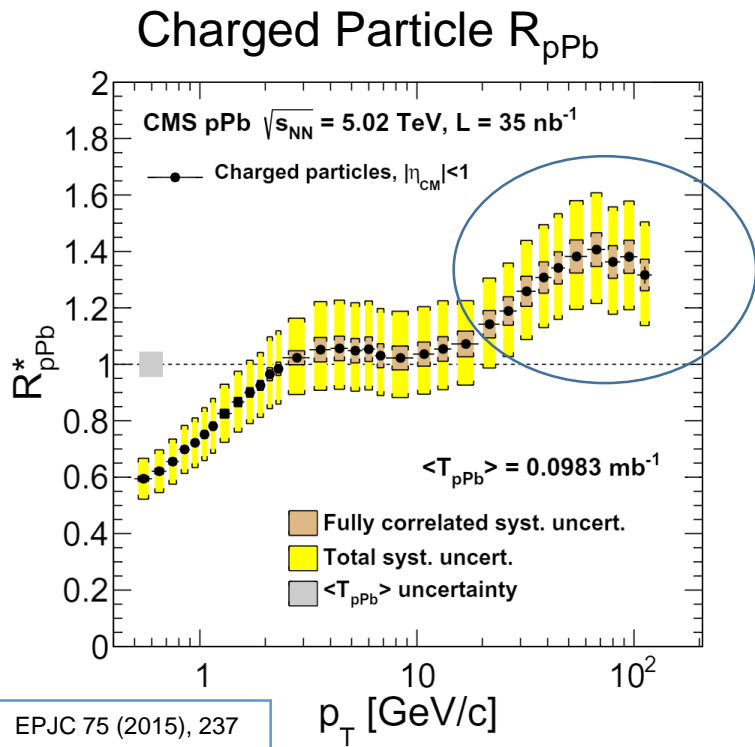
Y(1S) and Y(2S) R_{AA} flat vs. p_T and y

New charmonium results are also presented

Mihee Jo

Yongsun Kim

Jet Fragmentation Function in pPb and PbPb



Inside the jet cone: more low p_T tracks in **PbPb** than in pp

Jet fragmentation function in **pPb** is **unmodified** with respect to an **interpolated** pp reference

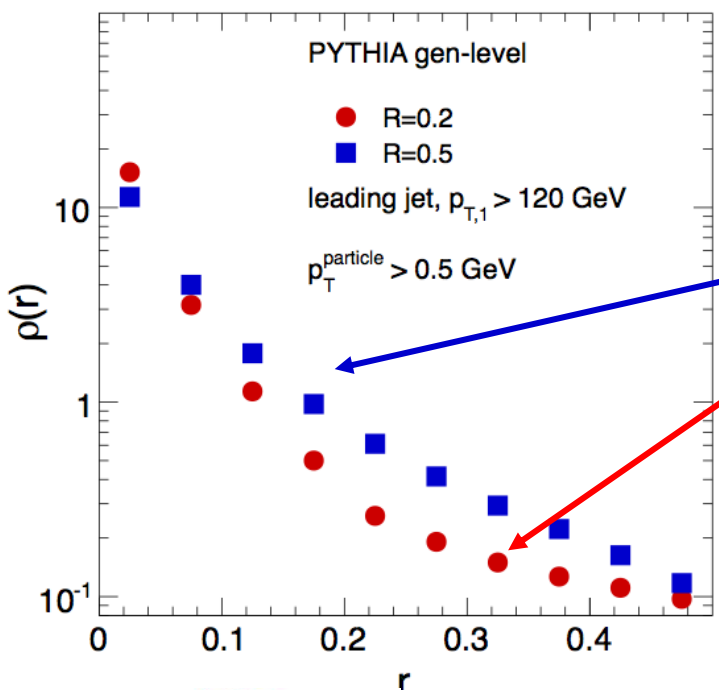
Austin Baty



CMS-PAS-HIN-15-004

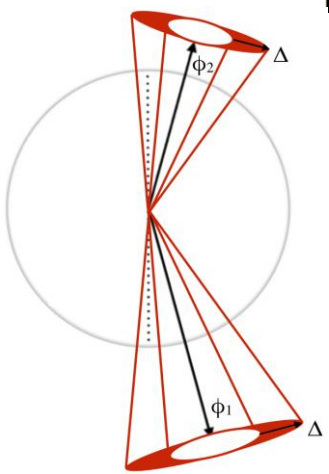
“Shooting Jets with Different Width” through the Medium

CMS-HIN-14-010

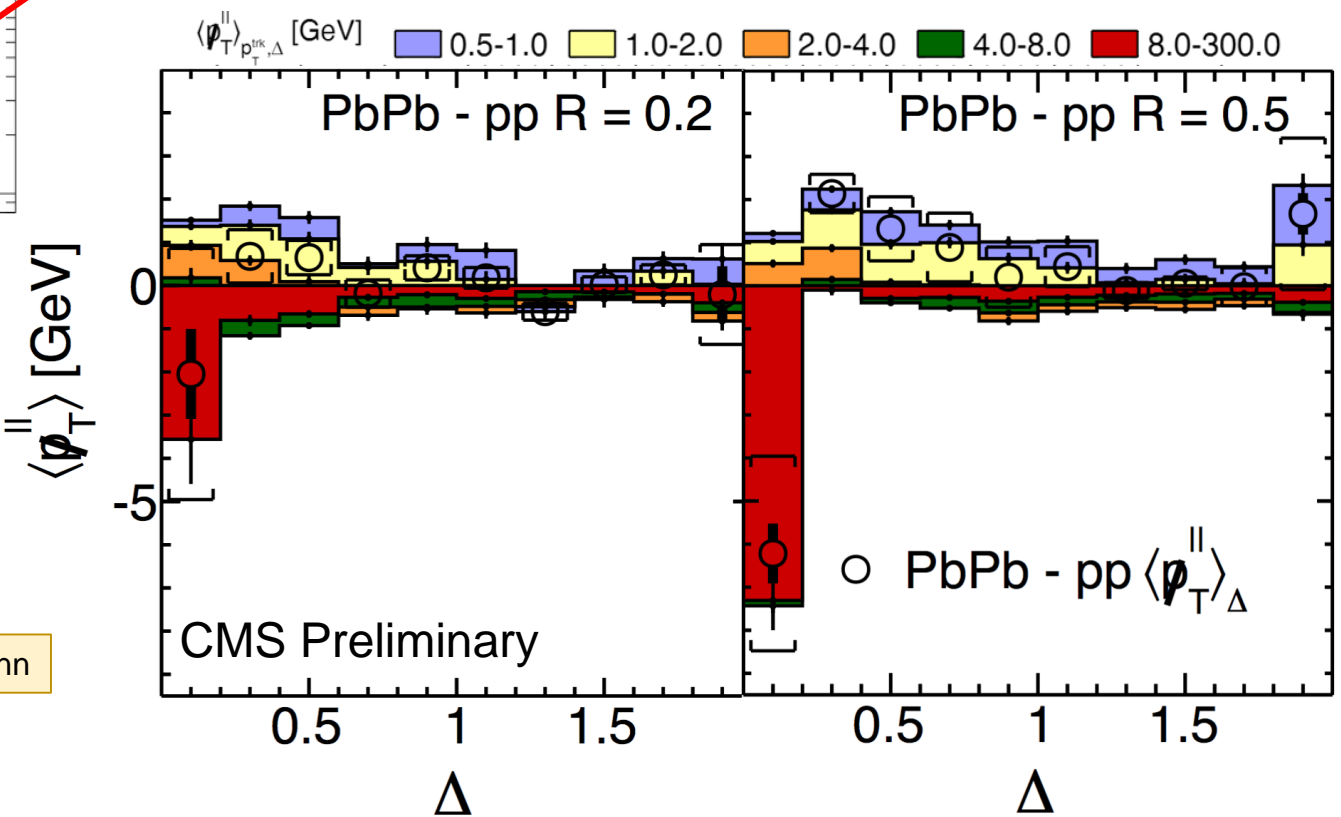


Jet shape from PYTHIA

R=0.5, "wider" jet
 R=0.2, "narrower" jet



Christopher McGinn



Angular distribution of quenched energy in dijets with different R

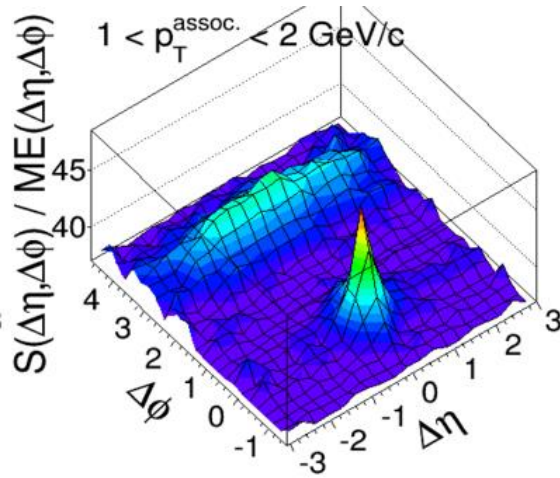


Jet-Track Correlation in PbPb



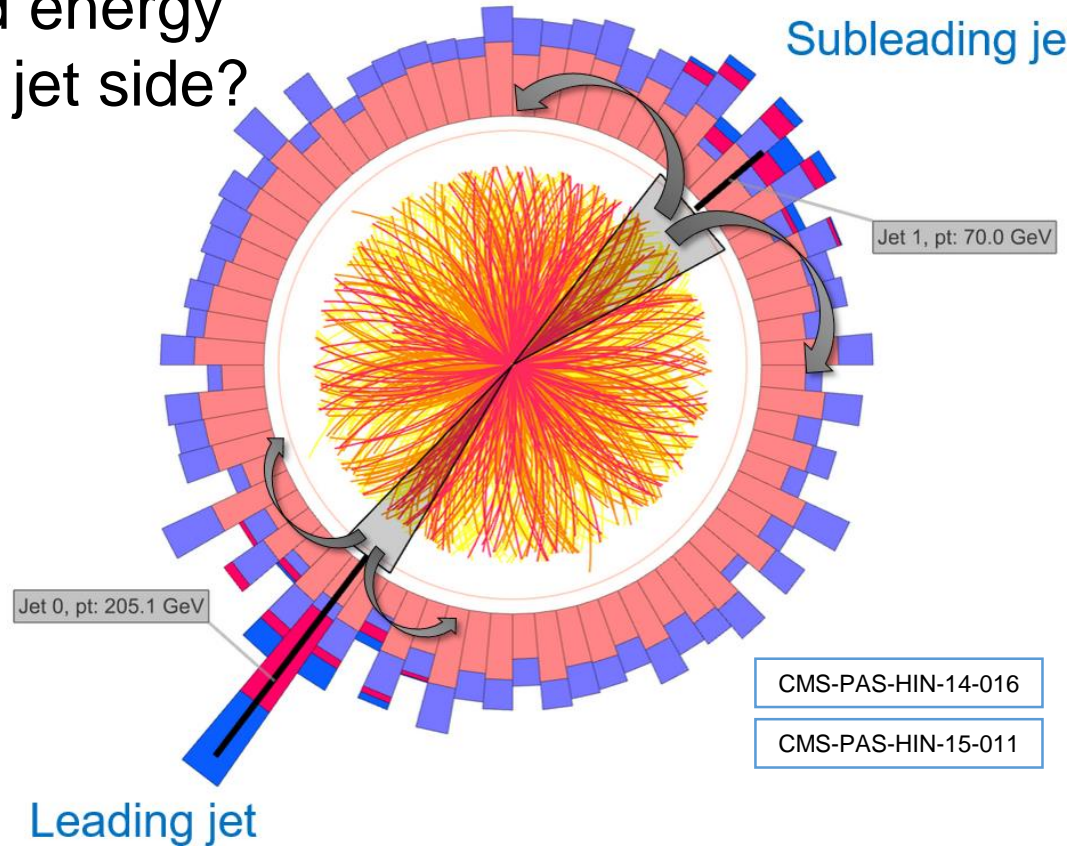
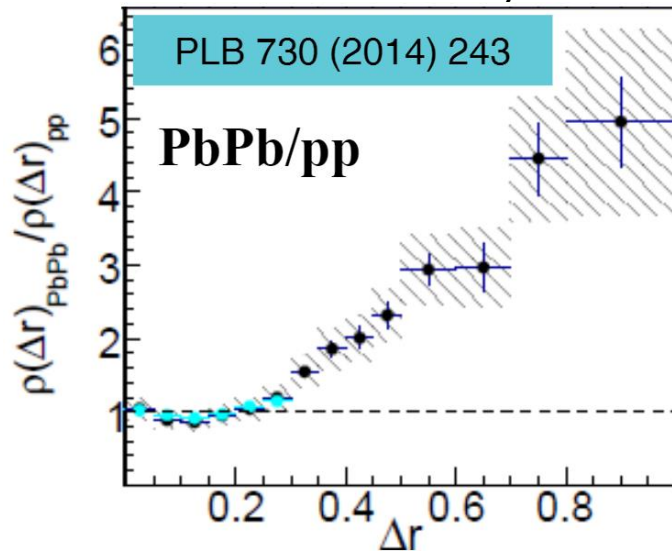
Can we decompose the radiated energy in the **Leading** and **Subleading** jet side?

Jet-track correlation in PbPb collisions



NEW

CMS Preliminary



CMS-PAS-HIN-14-016
CMS-PAS-HIN-15-011

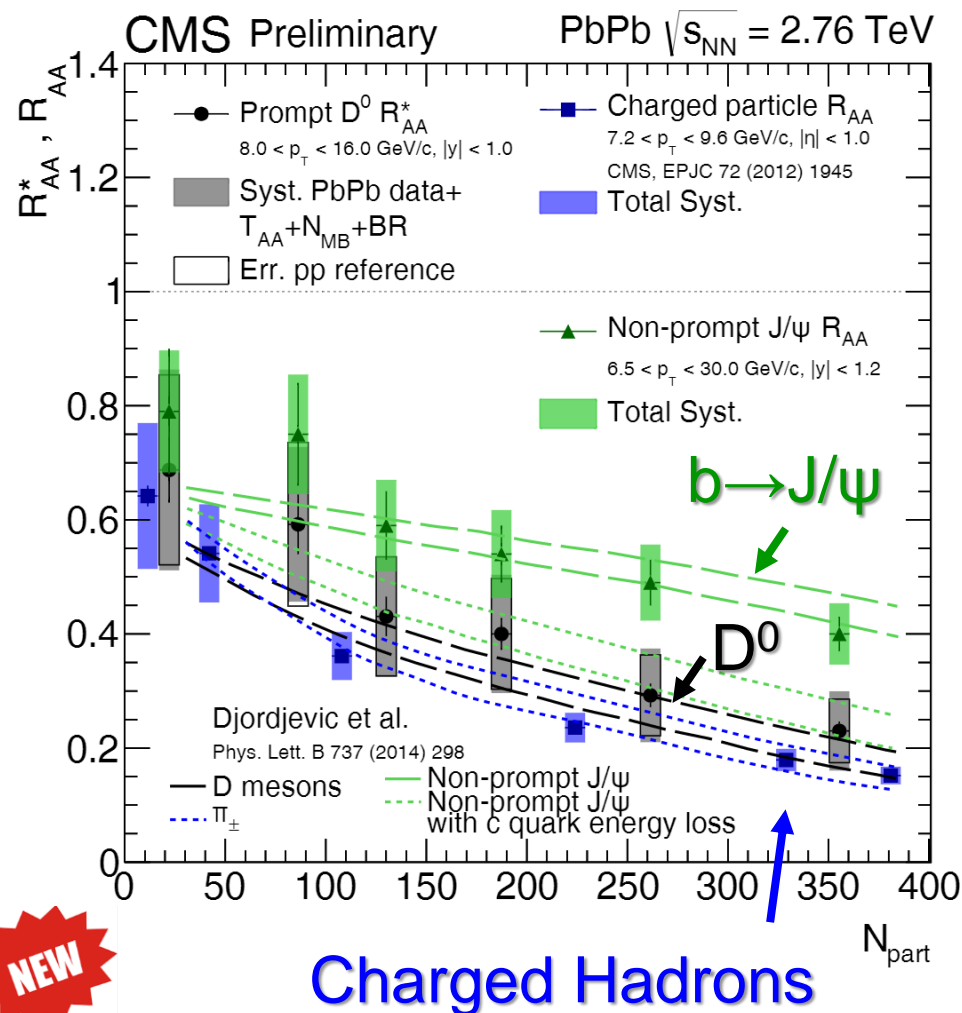
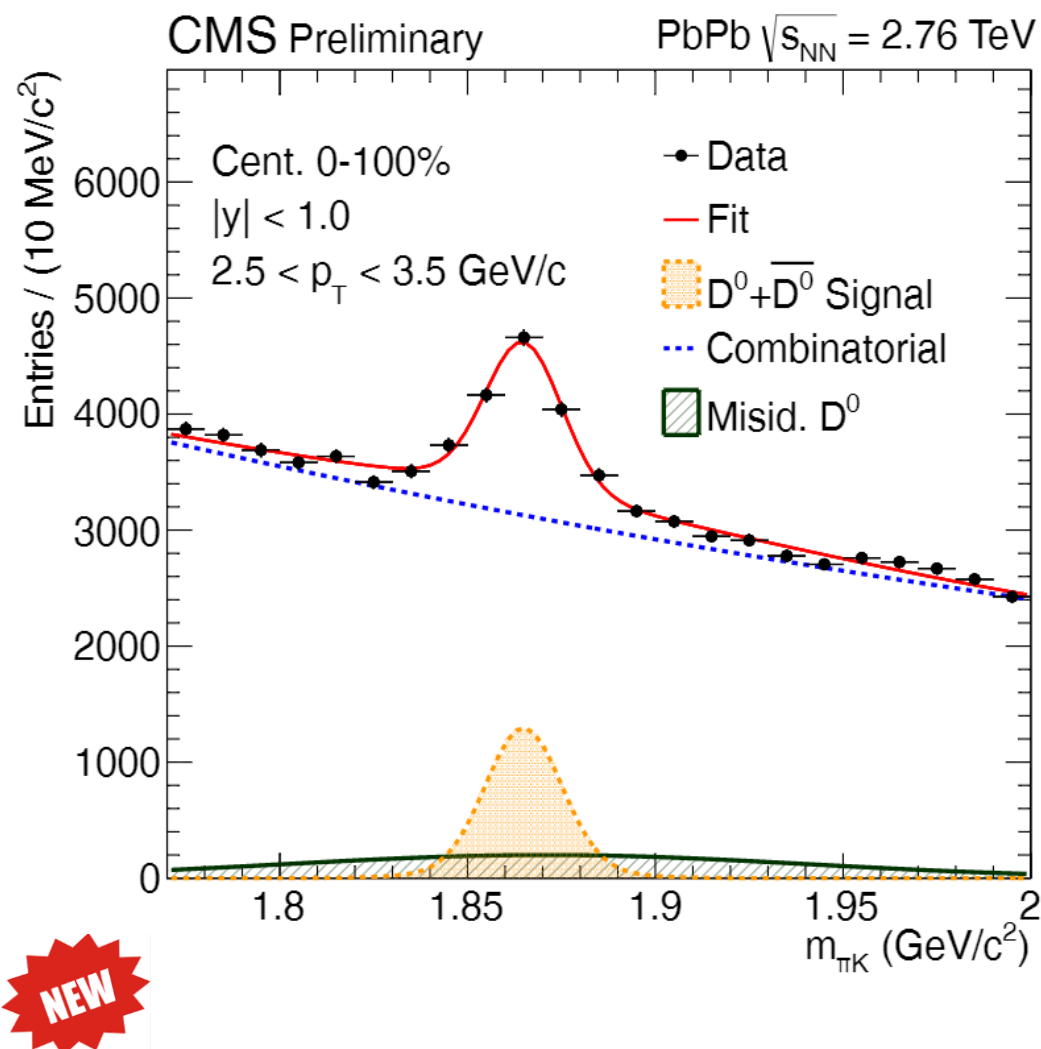
- Jet shape measurement **extended to large Δr**
- Momentum flow for the **leading** and **subleading jet!** (not shown)

Olga Evdokimov

Flavor Dependence of Jet Quenching

Fully reconstructed $D^0 \rightarrow K^- \pi^+$ over a wide kinematic range

CMS-PAS-HIN-15-005



D^0 results from $2.5 < p_T < 40$ GeV/c for different centralities are also presented
(Also the first **c-jet** measurement in pPb)

Kurt Jung (Poster)

Jian Sun (Talk)
Yen-Jie Lee (Poster)



List of CMS Talks and Posters

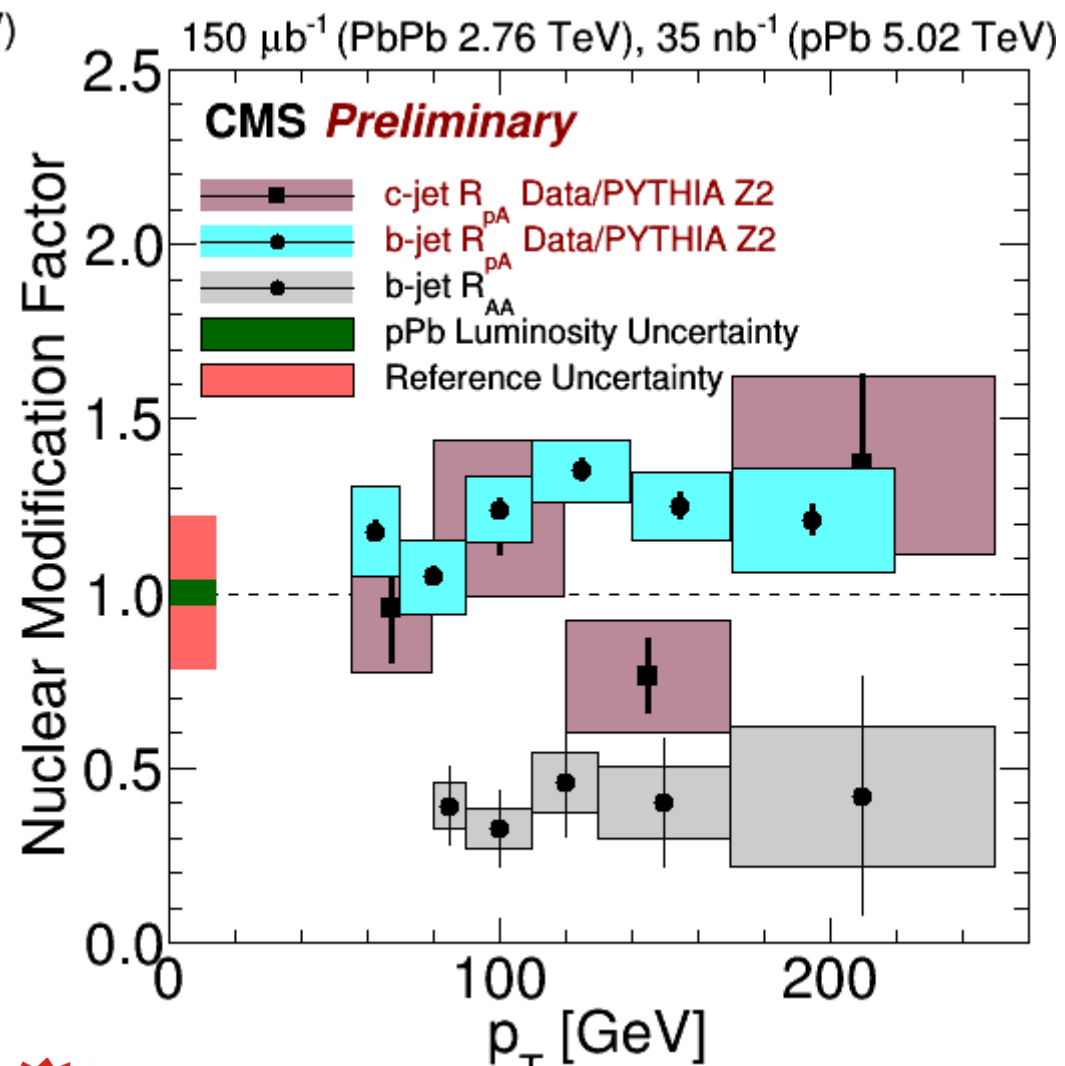
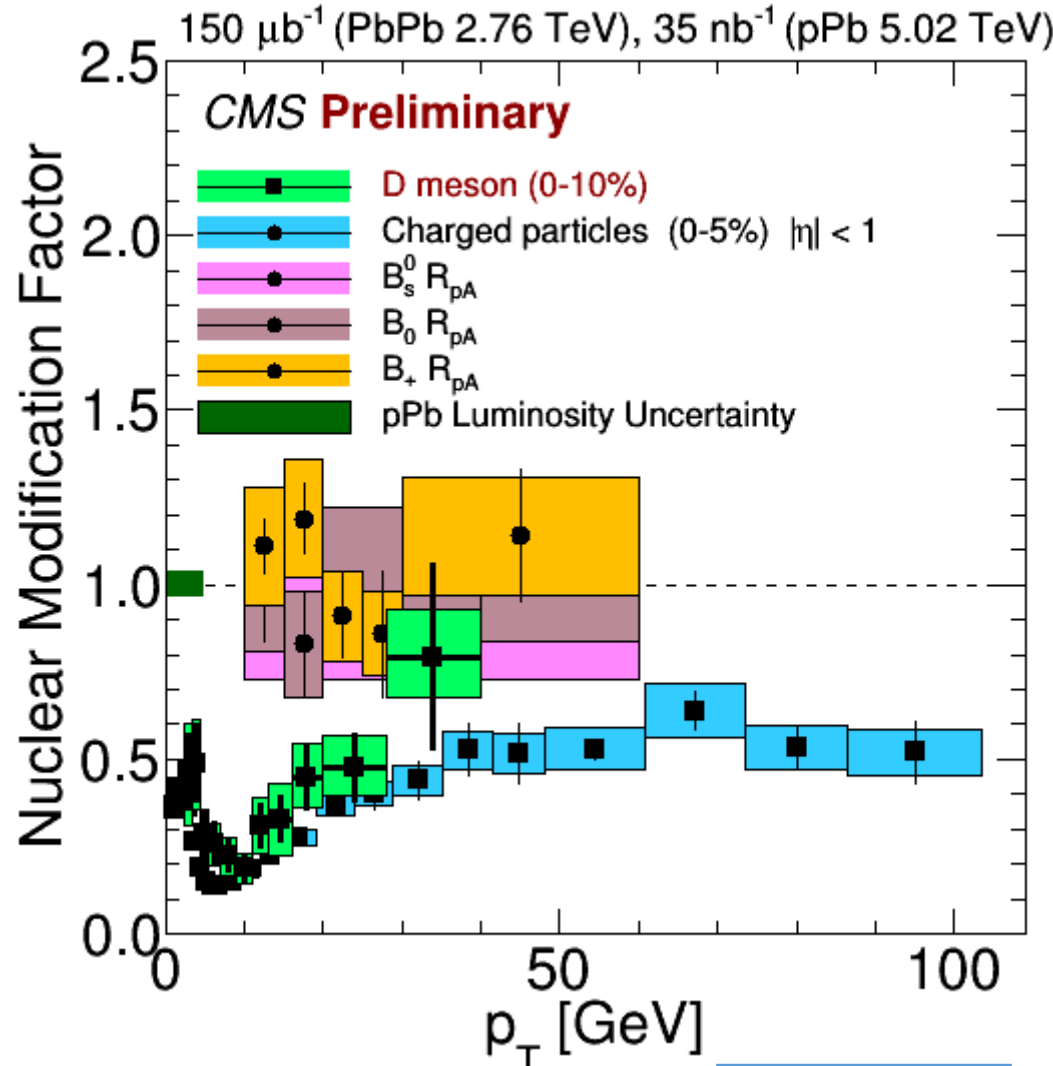
Physics	Topics	Talks/Posters
Global observable, collectivity and fluctuation	Transverse-energy flow in pPb	M. Murray
	Multi-particle correlation in pPb	Q. Wang
	Long-range correlation in high-multiplicity pp events	Z. Chen
	Ridges in pp, pPb and PbPb	S. Padula (Poster)
	K_S^0 , Λ , and Ξ in pp, pPb and PbPb	H. Ni
	Multiplicity dependence of Ξ in pp, pPb and PbPb	Z. Tu (Poster)
	Longitudinal fluctuation in PbPb and pPb	M. Guilbaud
	PCA of two-particle correlations in PbPb and pPb	J. Milosevic
Production mechanism and initial state effect (nPDF)	Jet fragmentation in pPb	A. A. Baty
	J/ψ in pPb and PbPb	Y. Kim
	B in pPb	K. Lee (Poster)
	W and Z productions in pp, pPb and PbPb	E. Chapon
Final state effect (Energy loss and melting)	Missing p_T analysis in PbPb	C. McGinn
	Energy balance of the quenched jets in PbPb	O. Evdokimov
	Nuclear modification of jets in PbPb and pPb	R. K. Elayavalli (Poster)
	Υ in PbPb and pPb	M. Jo
	Open heavy flavors in PbPb and pPb	J. Sun
	D in PbPb	Y.-J. Lee (Poster)
	Heavy-flavored jets in PbPb and pPb	K. E. Jung (Poster)

Backup Slides

Heavy Flavor Mesons and Jets

B meson in pPb and **D meson** in PbPb

First **c-jet** measurement in pPb!



B meson
Kisoo Lee (Poster)

D meson
Jian Sun (Talk)
Yen-Jie Lee (Poster)

arXiv 1508.06678
Submitted to PRL



CMS-PAS-HIN-15-005

PRL 113 (2014) 132301

CMS-PAS-HIN-15-012



CMS-PAS-HIN-14-007

Kurt Jung (Poster)