

CMS Heavy Ions (CMSIL)



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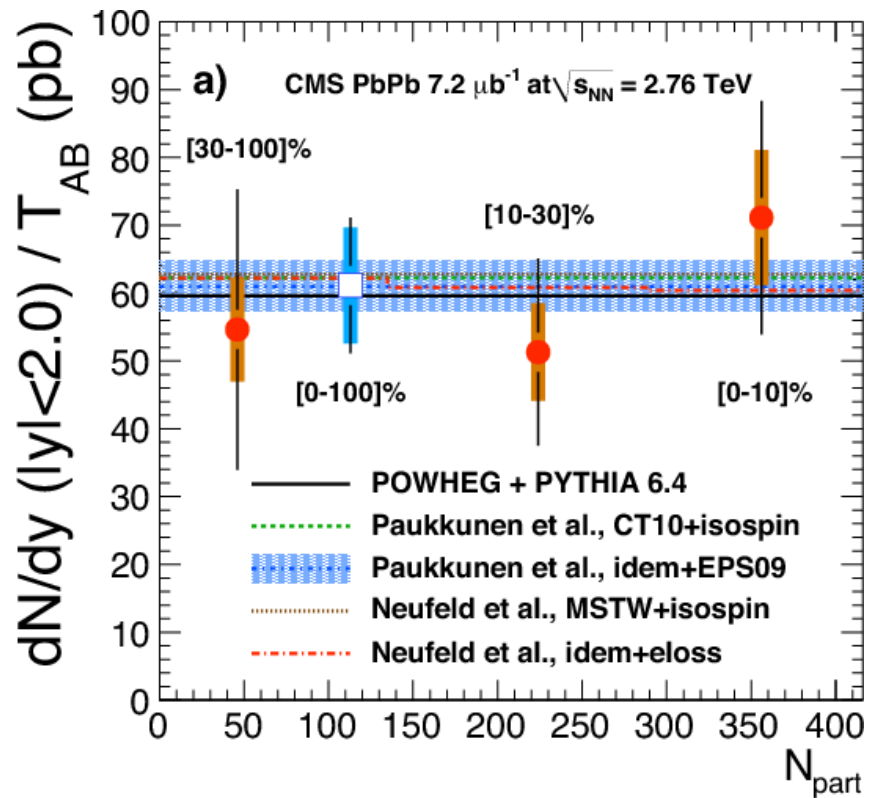
In short...

- Korea University + Laboratoire Leprince-Ringuet are collaborating since 2010 in the [dilepton] subgroup of the CMS heavy-ion working group
 - Its two main contributors
 - 10+ analyses / 4 papers / 4 preliminary results together
 - Six examples in the next slides
- The strength and expertise are weakening
 - We seek the help of FKPPL to maintain the physics result flow → securing one of the key-player of the effort
- Our physics: looking for manifestations of the quark gluon plasma with the CMS detector
 - Looking for particles melting (or not) in the plasma

1. First observation of Z bosons

- Unmodified by the plasma
 - Standard candles
- Contact: C. Silvestre, graduated at LLR&CEA, postdoc at Los Alamos, stationed at CERN, helped by Korean PhD students
 - Plenary talk at Quark Matter'11

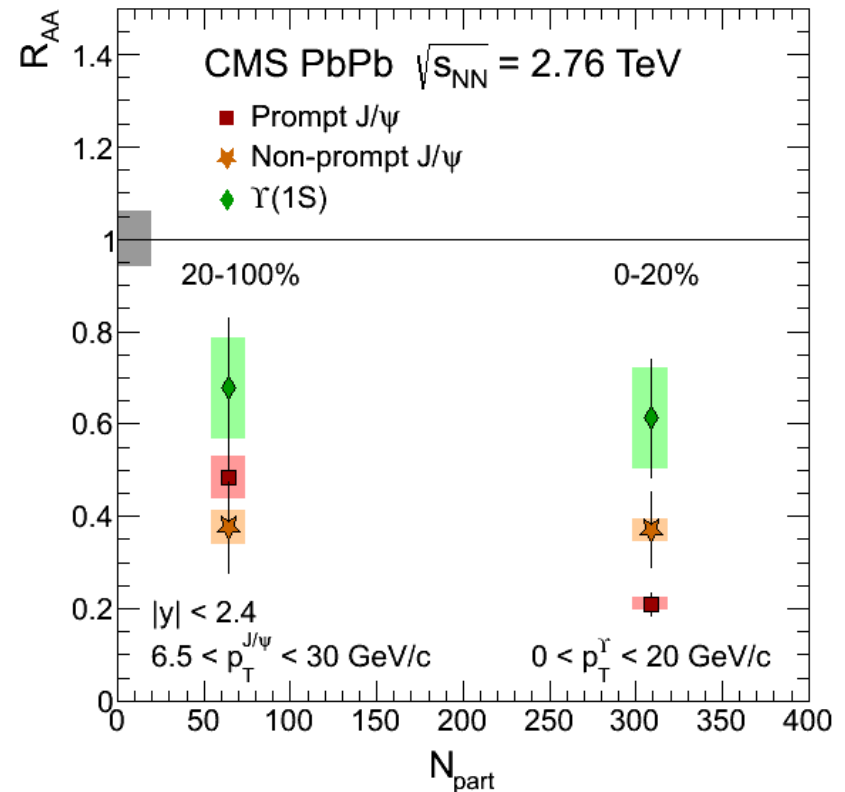
PRL106 (2011) 212301,
64 citations



x-axis \approx centrality
of the PbPb collisions

2. J/ψ , $\Upsilon(1S)$ & $B \rightarrow J/\psi$

- All suppressed in QGP
 - First direct observation of b-quark energy loss
- Contact: T. Dahms, postdoc at LLR, group effort, enormous help from Korean students
 - Parallel talk at QM'11
 - Flashtalk for Mihee Jo for the $B \rightarrow J/\psi$ part

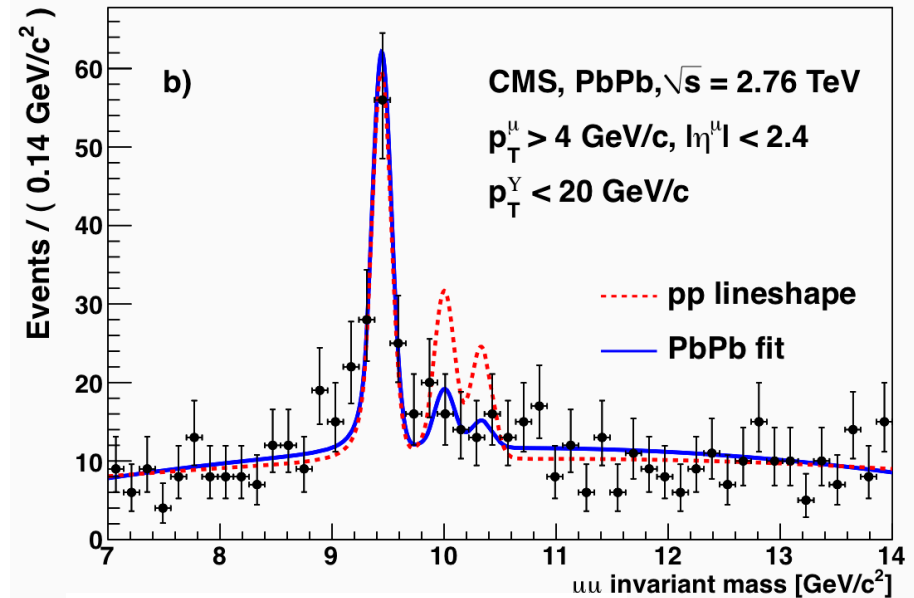


JHEP05 (2012) 063,
153 citations

3. Y(2S) and Y(3S)

- First observation of the melting of Y(2S) & Y(3S)
 - Iconic plot of the HI programme at LHC
- Contact: R.GdC, help from all the [dilepton] crew

+ 2 other papers (PbPb & pPb) on Y(nS) + 1 paper on $\psi(nS)$



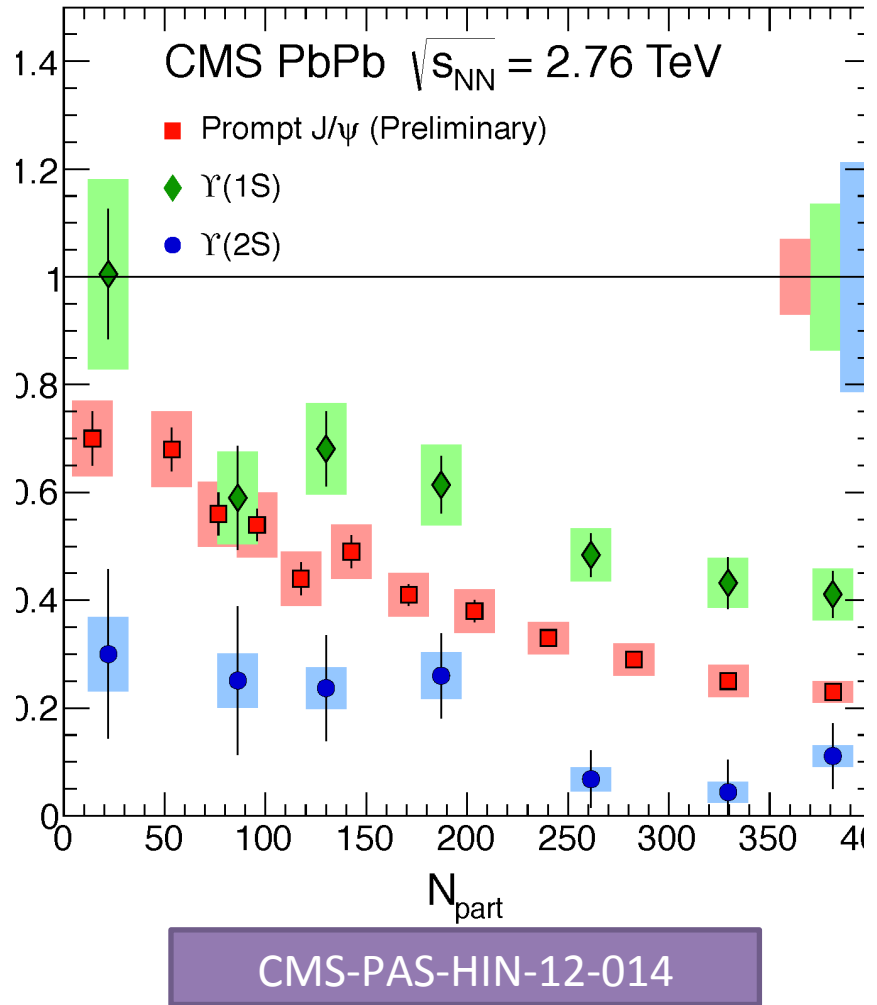
$$\frac{Y(2S + 3S)/Y(1S)|_{\text{PbPb}}}{Y(2S + 3S)/Y(1S)|_{\text{pp}}} =$$

$$0.31_{-0.15}^{+0.19} \text{ (stat.)} \pm 0.03 \text{ (syst.)},$$

PRL107 (2011) 052302,
122 citations

4. More on J/ψ & $B \rightarrow J/\psi$

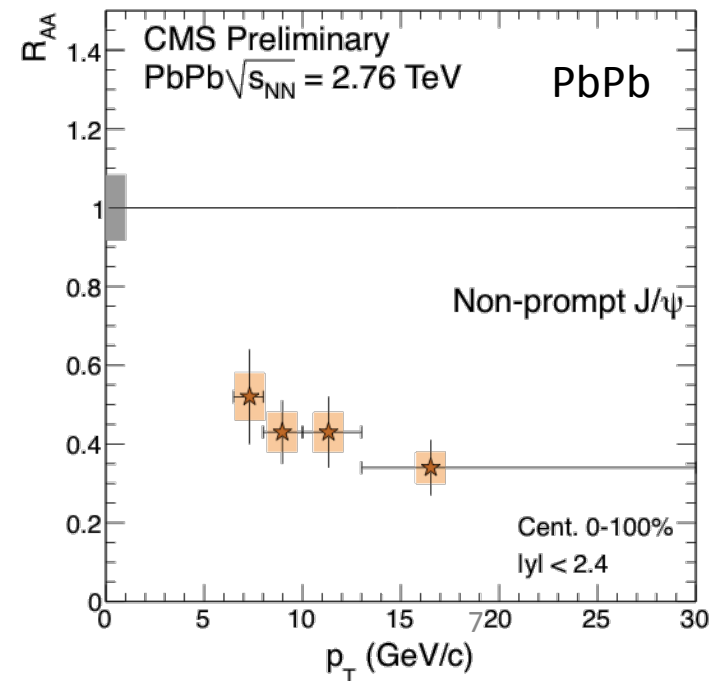
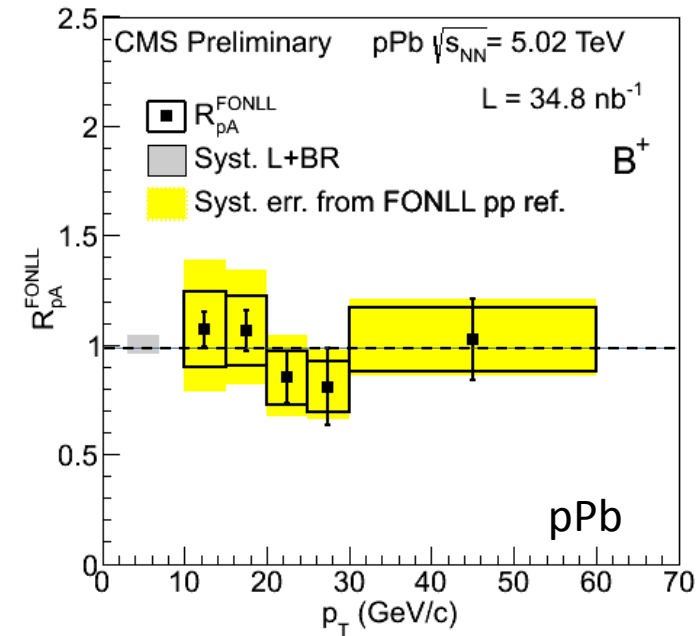
- Centrality dependence
- Contact: C. Mironov, postdoc at LLR, helped by Korean students
 - Plenary talk at QM'12
 - Parallel by DH Moon
 - Parallel by Mihee Jo



5. B mesons

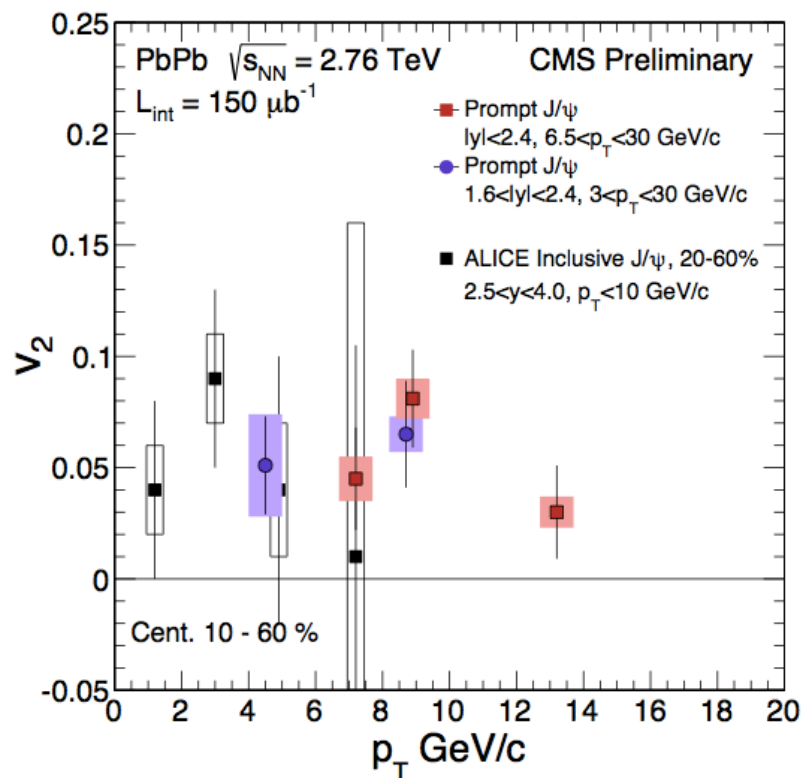
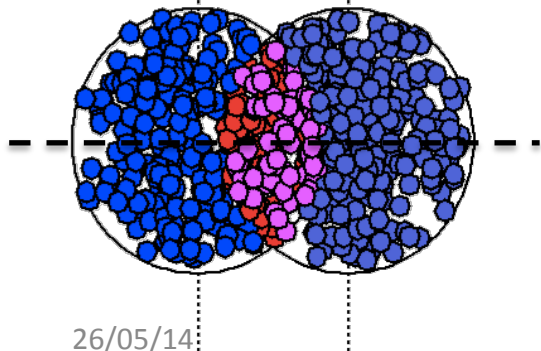
- Unsuppressed in pPb collisions
 - Exclusive decay of B^+ , B^0 and B_s
- Contact: H. Kim, korean PhD, with help of various institutes, R. GdC being the analysis review chair
 - Parallel talk at QM'14
 - Flash talk at QM'14 (for American colleague)
- Displaced J/ψ is the area of expertise of the Korean group

CMS-PAS-HIN-14-004



6. J/ψ azimuthal anisotropy

- Azimuthal anisotropy of J/ψ at high p_T
 - Unexpected
- Contact: DH Moon, korean PhD, now postdoc at Chicago, helped by C. Mironov



CMS-PAS-HIN-12-001

Responsibilities

- Technical aspects (muon reconstruction and triggering in the HI environment) covered by LLR & Korea U.
 - C. Mironov, deputy Mihee Jo, natural replacement
- Analysis coordination
 - R. GdC & M. Nguyen CMS heavy-ion conveners
 - R. GdC, T. Dahms [dilepton] leaders, next should be Korean
- Member of the CMS international committee
 - R. GdC, seeking new collaborators, in particular in Korea, and for heavy-ion physics

Present situation

- [dilepton] group, driven by our institutions
- Crumbling activity, losing the expertise
 - C. Silvestre, T. Dahms, DH Moon, C. Mironov all left our groups, only Moon stayed in CMS (US)...
 - No 1%1 replacement (end of a ERC grant at LLR)
 - The pace of results is slowing down (no ψ in pPb yet...)
- Help from FKPPL
 1. Keep the expertise, which is now impersonated by Mihee Jo, best Korean student so far → 1-year postdoc to secure her
 2. Initiate a longer term collaboration (dual PhD degrees, sabbatical, other institutions...) → travel money

Short- and Mid-term prospect

- Analyse together the J/ψ and ψ' in pPb collisions
 - (a strange behaviour of the ψ' was seen for the in PbPb collisions...)
- Assemble a task force to push the J/ψ and ψ' reconstruction down to lower p_T
 - In the forward region, as already done for pp
 - Postdocs Chapon + Mihee Jo (?)
- Develop the muon trigger strategy for 2015
- Analyse the 2015 run data

BACK UP

Money chart

Requested LIA specific funding from France				
Description	Euro/unit	Nb of units	Total (euros)	Requested to: *
Postdoc JO, Mihee	3685	6	22110	IN2P3
Visit to Korea	150	28	4200	IN2P3
Travels to Korea	1250	4	5000	IN2P3
Total			31310	IN2P3
Requested funding from Korea				
Description	Won/Unit	Nb of units	Total (Won)	Requested to: **
Postdoc JO, Mihee's stay at LLR	4,900,000/month	6 months	29,400,000	NRF
Visit to France(Flight + Local Expenses)	4,000,000/visit/man	3 visits*men	12,000,000	NRF
Total			41,400,000	NRF