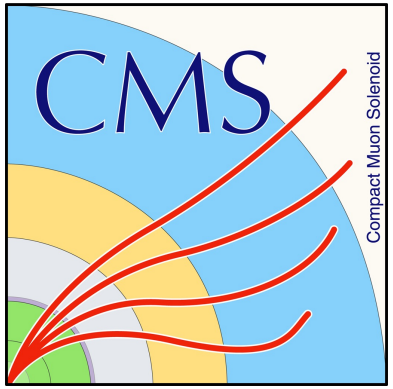

CNU Activity Report

Piljun Gwak[1]

[1]*Chonnam National University*

Short Introduce

Chonnam Nationa University at Gwangju, Korea

- 2 scientists
- 5 students

Bak, Gyeonghwan	Doctoral Student
Gwak, Piljun	Doctoral Student
Kim, Hyunchul	Physicist
Lee, Hanseul	Doctoral Student
Lee, Seonghak	Doctoral Student
Moon, Dong Ho	Physicist
Seo, Junhu	Doctoral Student

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- J/psi Polarization Study

Service Work

On-site shift

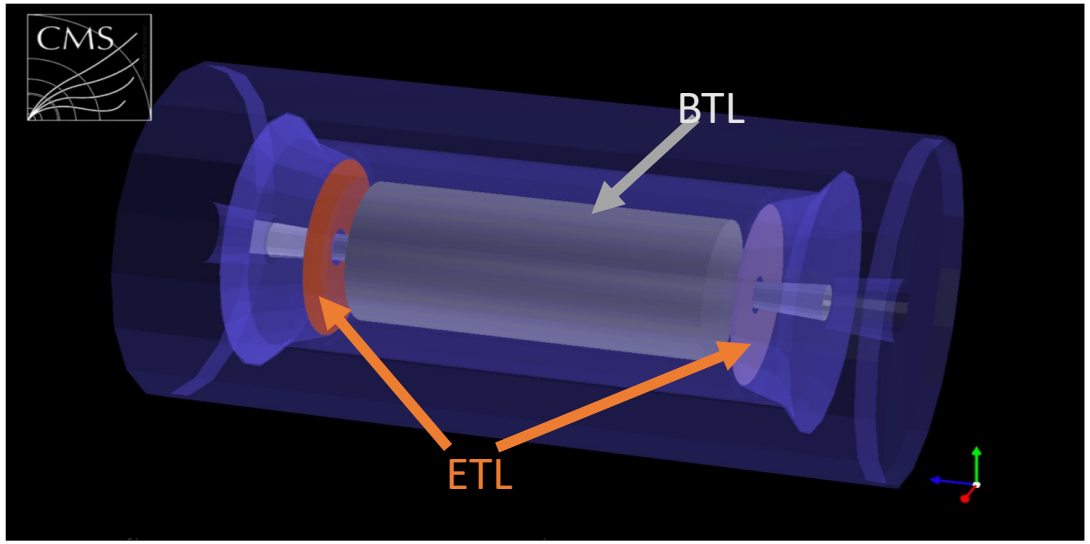
- P5 Techincal Shift in 2024
  - On-site shift is essential to run our detector
- CNU covered shifts
  - Corresponding 2.7 EPR points
  - by **Hyunchul and Dongho**

Summary of the institute (ALL members, in EPR months (*))

Work Due :	**16.00**
Work done :	**0.00**
Shift done :	**2.70**
Work + Shifts done :	**2.70**
Ratio done/Expected :	**0.17** (EPR work plus Shifts done)/(AuthorDue)

MTD

MIP Timing Detector



Pile-up

- One event can include several primary vertices
- Can't distinguish vertices at same position
- MTD is expected to reduce pile-up be used to select good vertex

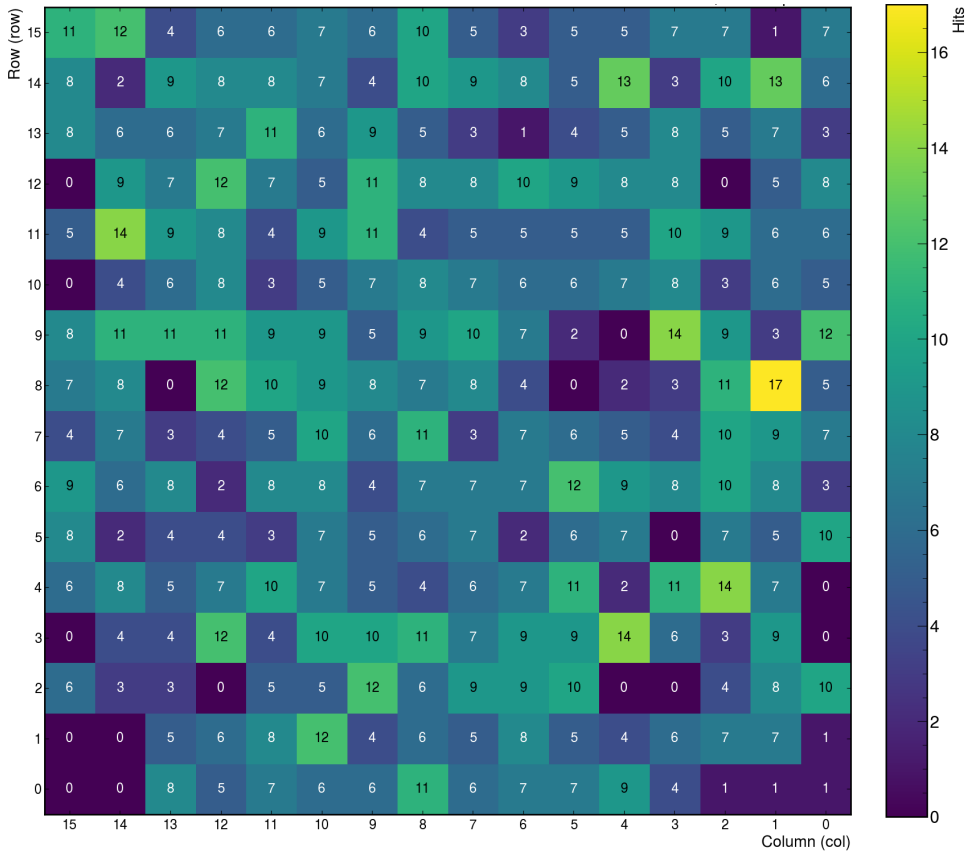
Hyunchul and **Seonghak** are working for ETROC

Seonghak

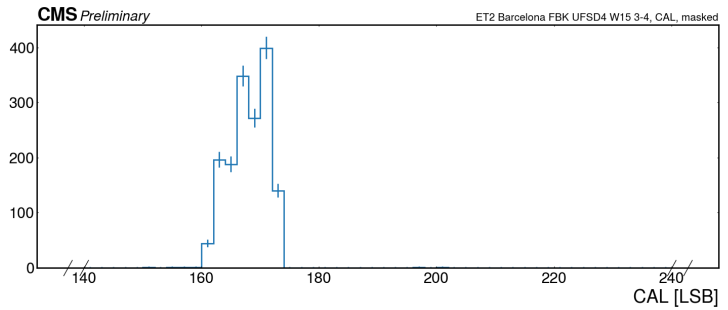
- Worked in Fermilab
- 23.06.19 – 24.05.06
- Now setting up the ETROC test

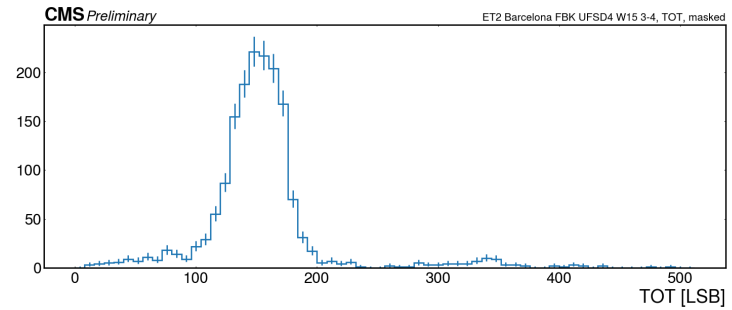
- Preparing the beam test in Gyeongju
  - Lifetime and performance test by radiation
  - 20 MeV proton
  - in October
  - Hyunchul will show more slides today

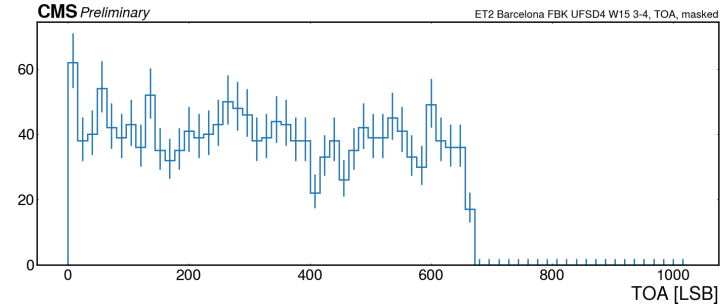
MTD

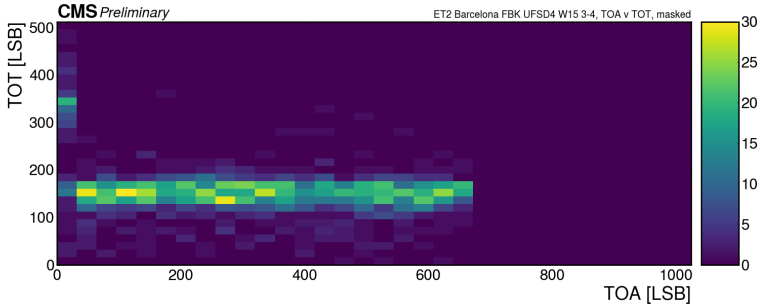


Figs of 4 hours cosmic run test at FNAL by Seonghak









P&R

L1 Offline software and Computing (O&C)

→ L2 Computing Operation

→ **L3 Production and Reprocessing** (P&R)

Works of P&R

- Coordinating crab jobs requested by CMS users.
  - MC and data samples
- Accepting and assigning the campaign
- Monitoring jobs, investigating and resolving errors
- Develop the tools to automate the system

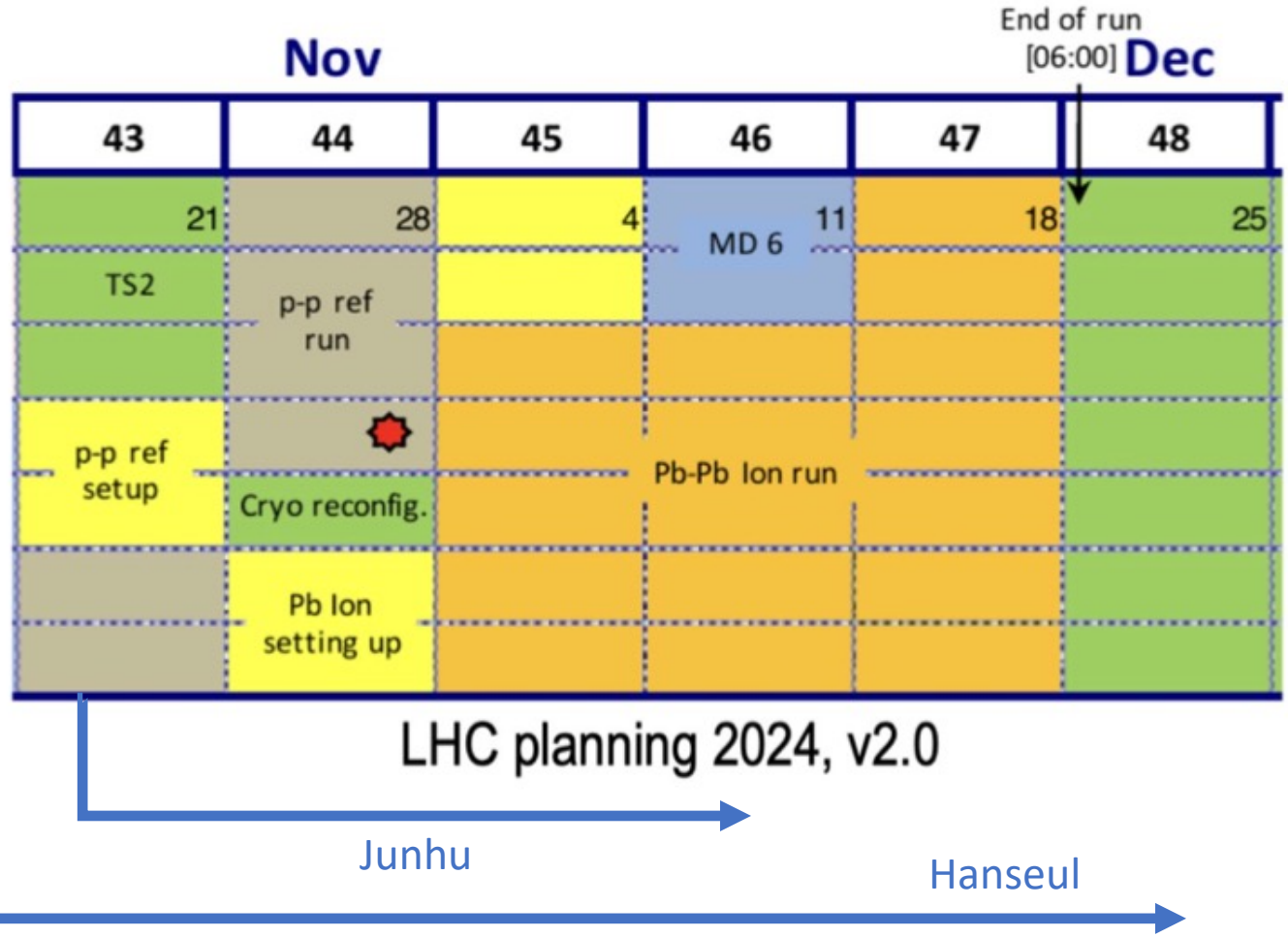
Piljun

- Main Workflow Manager
- Documenting the operation process and issues

Junhu

- Workflow Manager

Run3 at CERN



- Junhu and Hanseul will visit at CERN for run3 data taking
- Junhu: End of Oct. – Middle of Nov.
- Hanseul: 8th Oct. – 3rd Dec.
  - Also for technical shifts
  - DQM (?)

Analysis

Charmonia R_{AA} Measurement

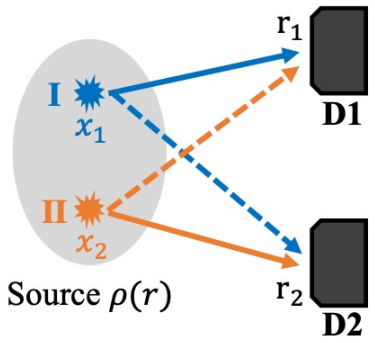
- Measuring the nuclear modification factors of J/Ψ and Ψ(2S) to investigate property of GQP
- Manpower
  - Gyeonghwan, Hanseul, Piljun, Hyuncul and Dongho in CNU
  - Soohwan and Junseok in KU

- Gyeonghwan will show more plots

BEC Study

Femtoscopy with Bose-Einstein correlation (BEC)

- Studying the size and shape of source
- Using correlation identical bosons
- pPb 8.16 TeV in 2016
- Manpower
  - Junhu in CNU
  - Sunil in KNU
- Checking fitting method and deciding nominal results



$$P_{12} = 1 + cos[q(x_1 - x_2)] \quad \text{(where } \boldsymbol{q} \equiv \boldsymbol{k_1} - \boldsymbol{k_2}\text{)}$$

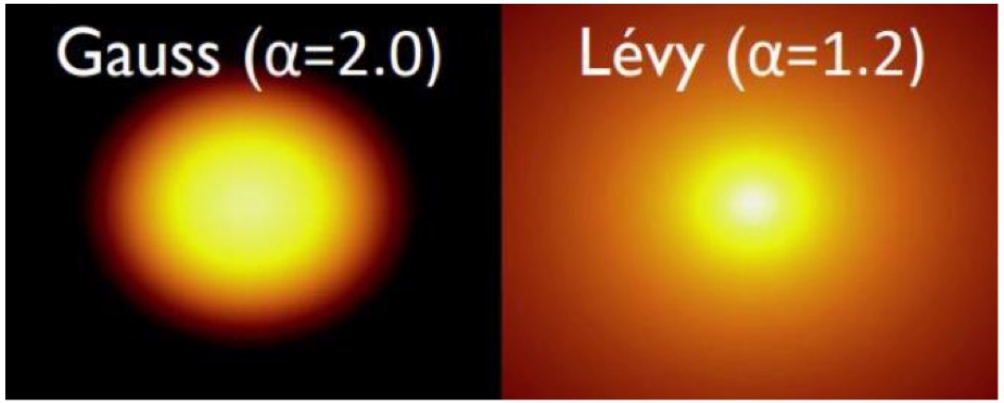
The correlation function

$$C(q) = \frac{P_{12}}{P_1 P_2} = 1 \pm \lambda |\tilde{\rho}(q)|^2 = 1 \pm \lambda e^{-|qR|^\alpha}$$

R: homogeneity length of the source

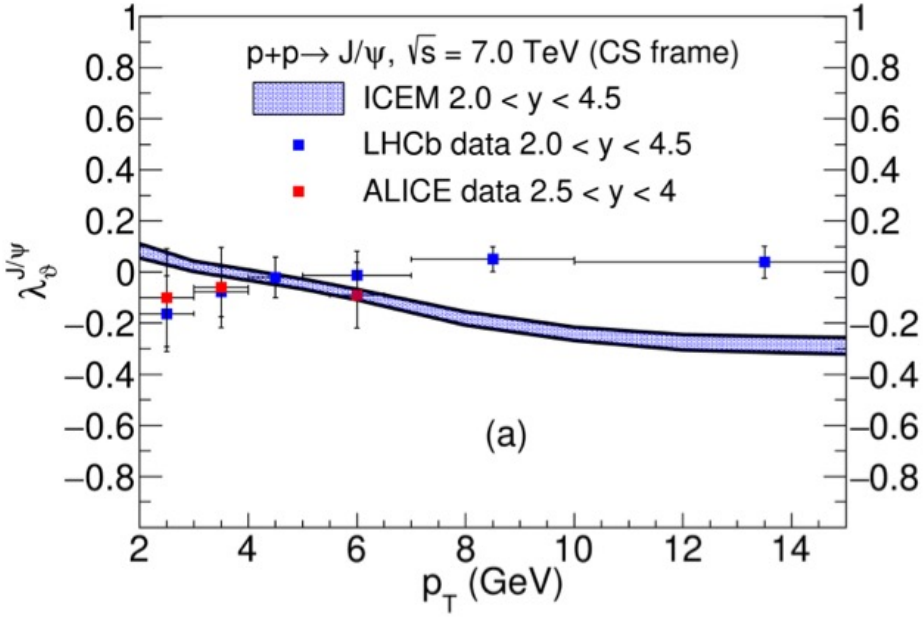
λ: chaoticity parameter

α: index of stability



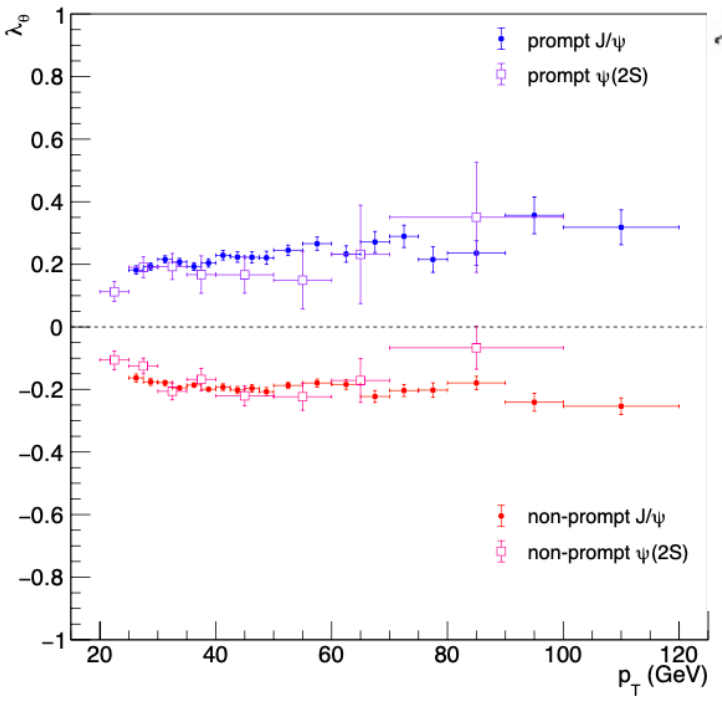
J/Ψ Polarization – Motivation

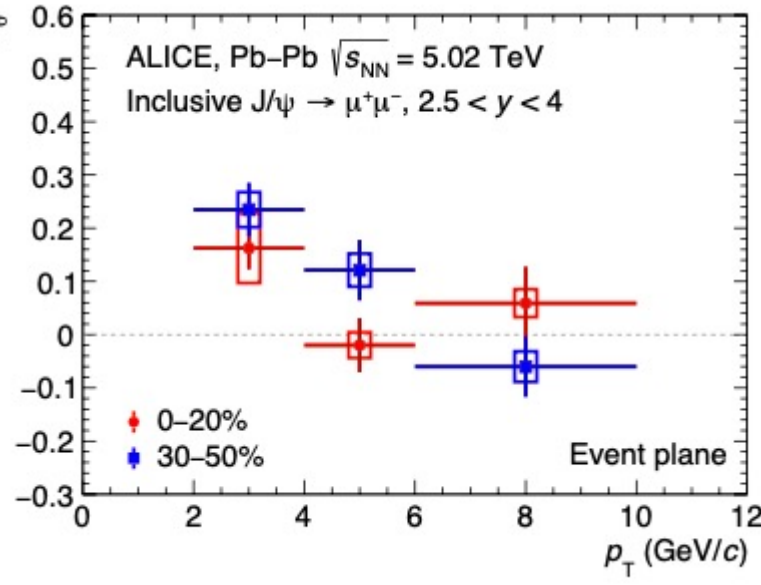
J/Ψ Polarization Puzzle



[from slidde of Zhenjun Xion]

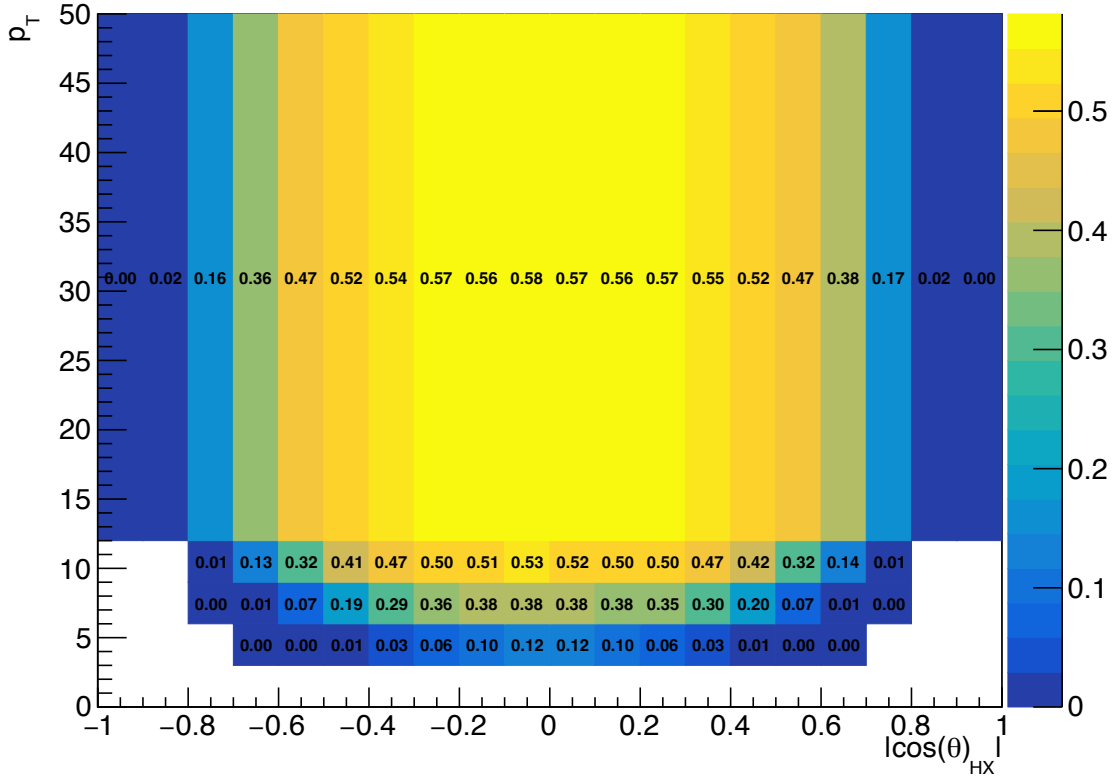
CMS & ALICE resultst





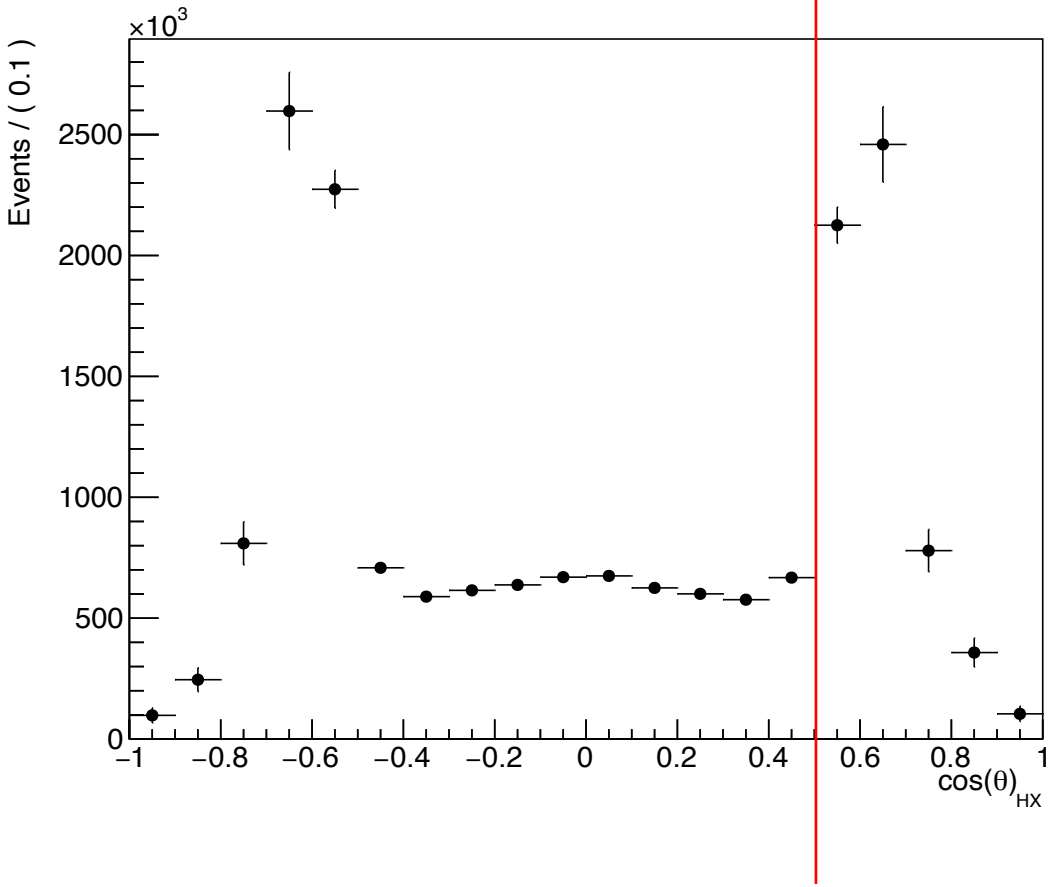
J/Ψ Polarization – Process

Eff. and Acc. weighting for centrality 0 – 90%, forward rapidity w.r.t. p_T vs cosθ



$3 < p_T < 6.0,\ 1.6 < y < 2.4$

Incorrect weighting effects



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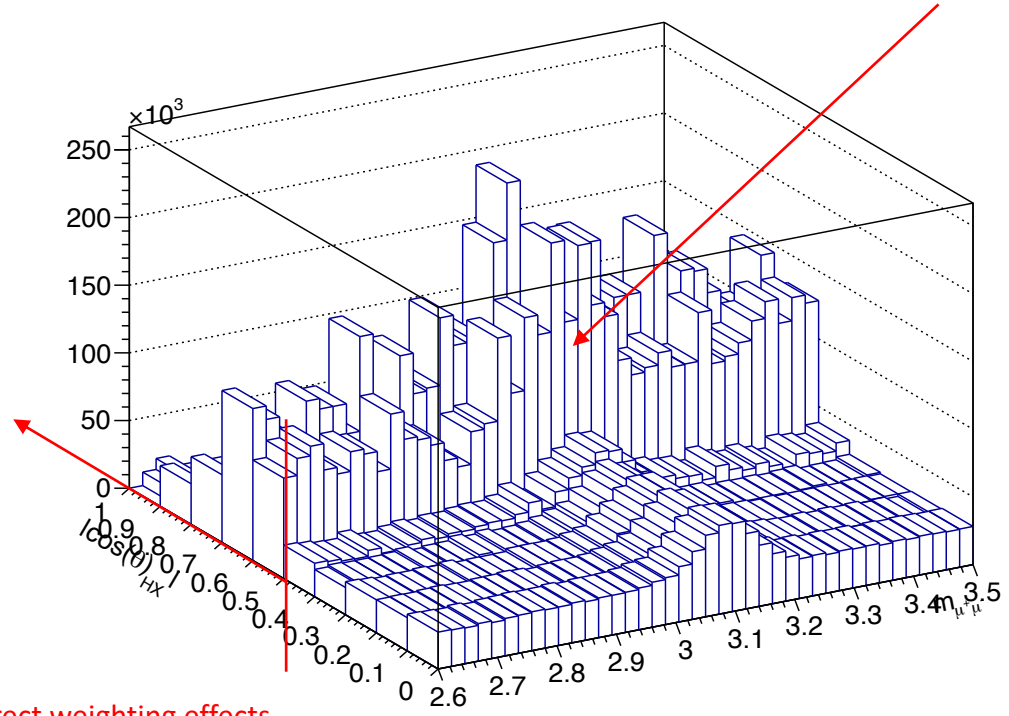
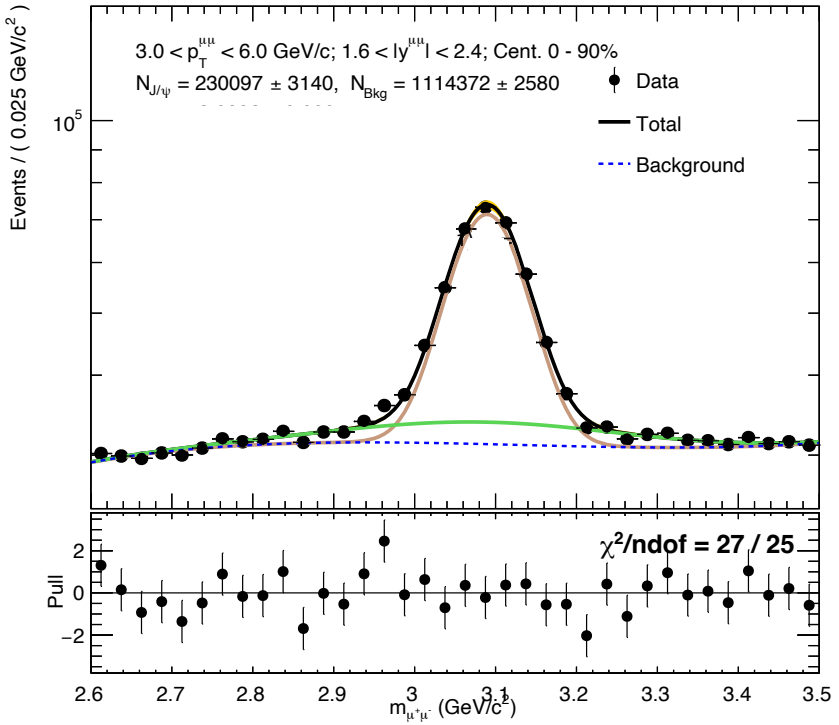
Too high due to wrong weighting



Incorrect weighting effects from cosθ > 0.5

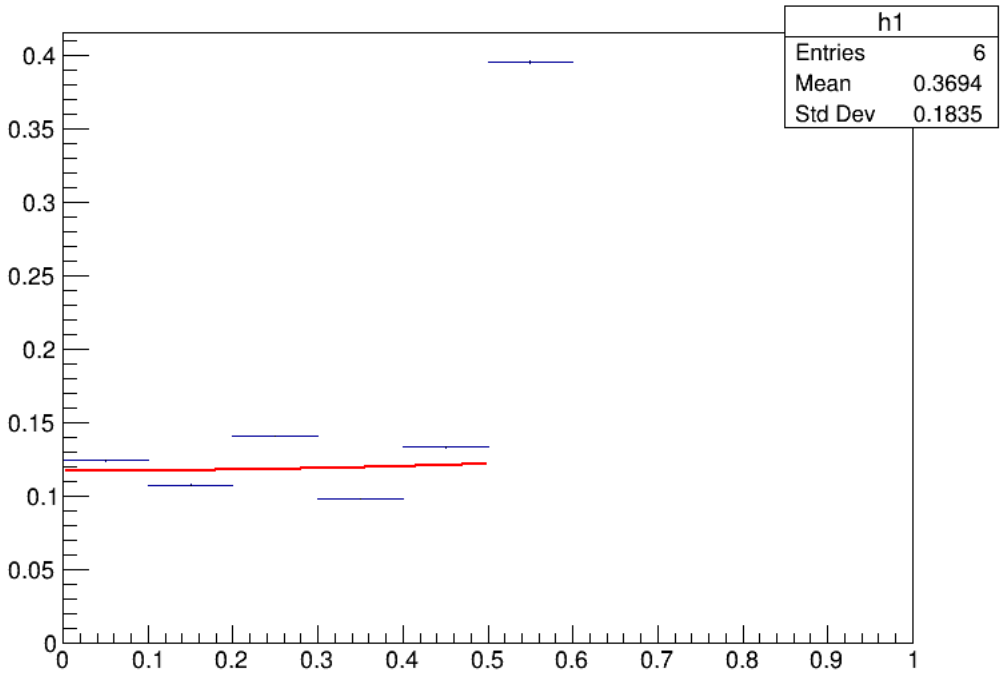
$0 < |\cos\theta\_HX| < 0.1$



Caveat: Very rough fit

J/Ψ Polarization – Present and Future

$3 < p_T < 6.0,\ 1.6 < y < 2.4$



So, is $\lambda_{\theta,HX} = 0.16$? → Not Yet

- Sensitive for fitting range, and mass fit quality is poor

Todo

- Checking skimming codes
- Calculation with cosϕ in HX

Backup