NMSU Update

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- Abi and Forhad has already reconstructed the data from run 2 and 3. This is done with `RS67`.
- Each reco. file contains 2 trees. For example,

```
TFile** merged_RS67_3089LH2.root
TFile*  merged_RS67_3089LH2.root
KEY:  TTree result;1  The tree for final results
KEY:  TTree result_mix;1  The tree for final results
```

  Mix tree contain the mixed events produced by NMSU method.
- We can get the raw DY signal by subtracting the mixed events from the raw events.
- For LH2 target with out any cuts, we have;

```
16517271 raw events
7945229 mix events
```

- We use the standard "Chuck cuts" for event selection.

  ```
  chuckCutsPositive_2111v42_tmp
  chuckCutsNegative_2111v42_tmp
  physicsCuts_noMassCut_2111v42_tmp
  chuckCutsDimuon_2111v42_tmp
  tempOcc
  ```

  Note that the last cut (and beam intensity optimization with D1 occupancy cut) is not yet implemented in this study.

- With these cuts;

  ```
  16521 raw events
  12513 DY events
  ```

- These cuts (except for mass and D1 occupancy) are already applied in Kei's MC study.

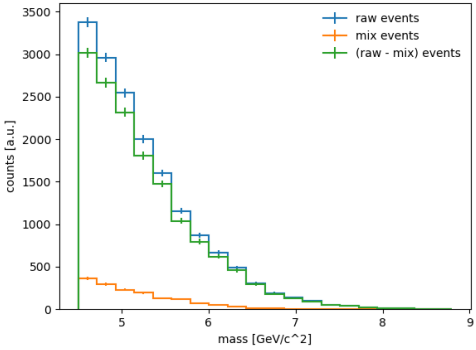

Figure 1: mass distribution.

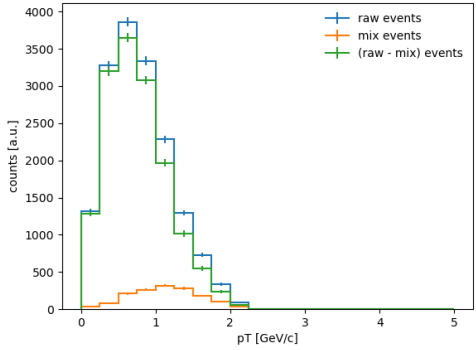

Figure 2: pT distribution.

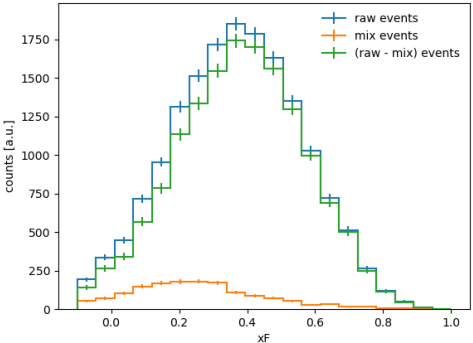

Figure 3: xF distribution.

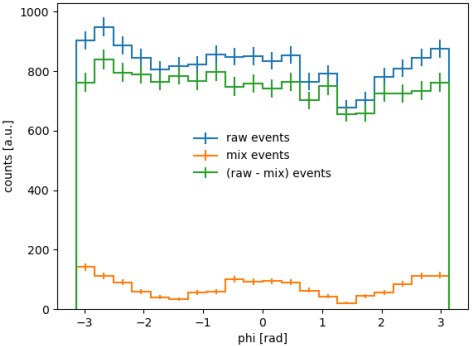

Figure 4: phi distribution.

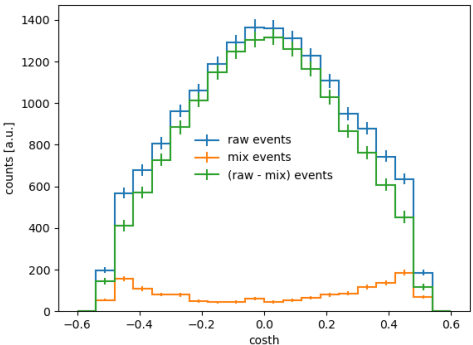

Figure 5: mass distribution.

- In this study, we have not subtract the empty flask events.
- Do we need to subtract the empty target events ?
- Creating a singularity image is still in progress. Found a memory issue. Need more investigation.
- Neet to cross check the cuts with Kei.

- We implemented inefficiency in the drift chambers depending on the hit position. Right now if the hit is at the edge of the detector, inefficiency is 5 %.
- Single track inefficiency and dimuon efficiency is calculated as;

```
trk_effi = st1_effi* st2_effi* st3_effi* y_effi
dim_effi = trk_effi_pos* trk_effi_neg
```

- We use this inefficiency as event weight.
- We use $A_N^{J/\psi} = 0.2$ for this study.

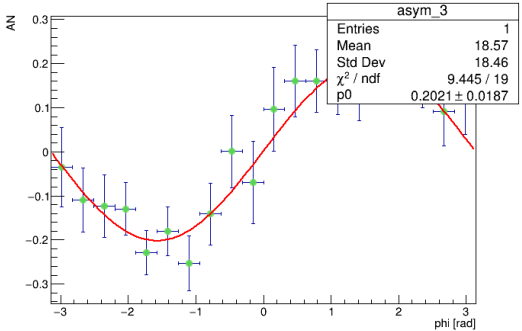

Figure 6: Extracted $A_N^{J/\psi}$ with out inefficiency.

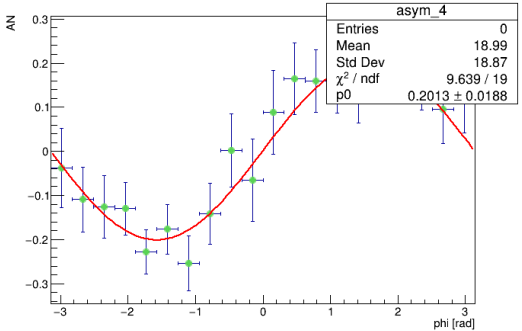

Figure 7: Extracted $A_N^{J/\psi}$ with inefficiency.