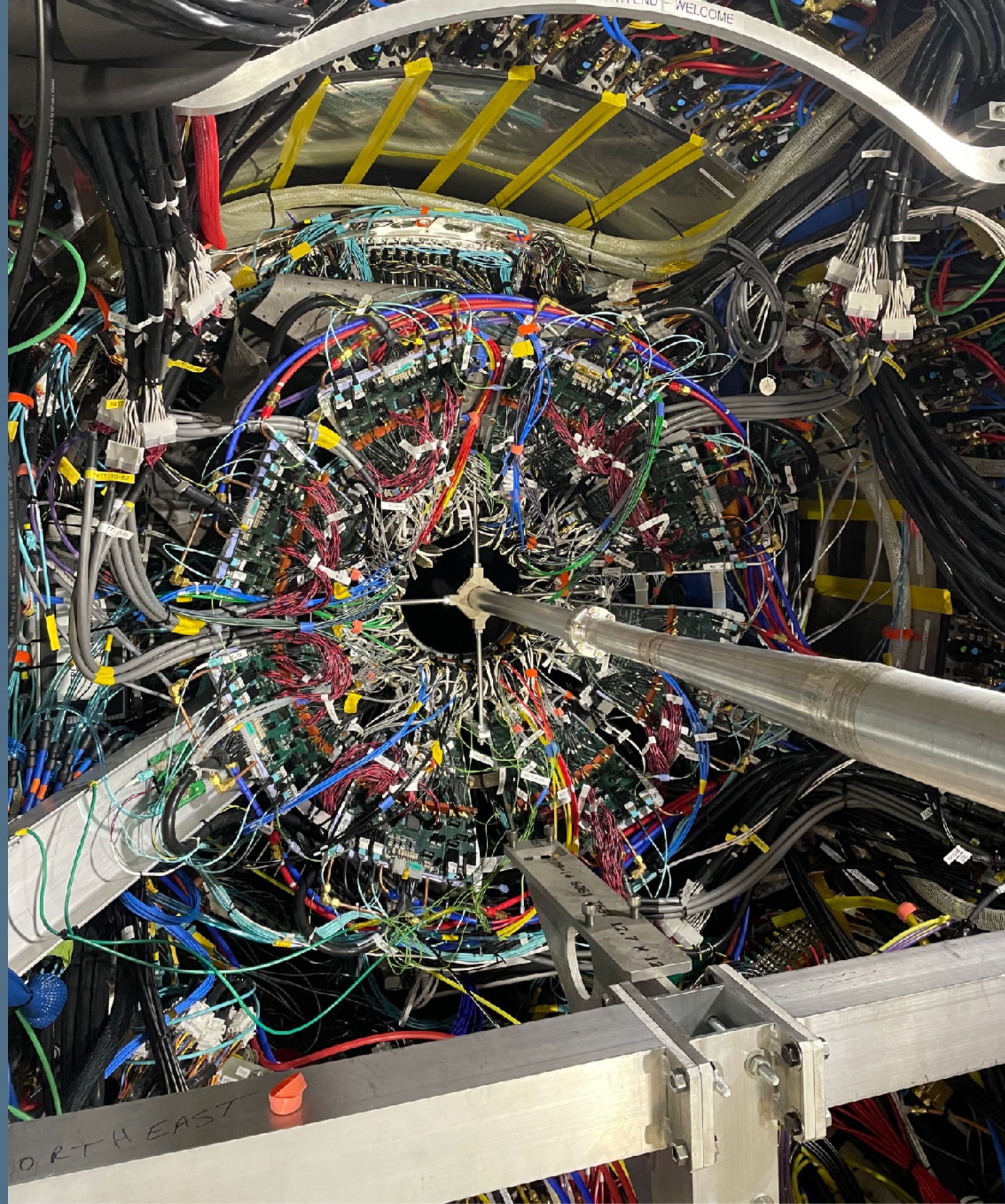


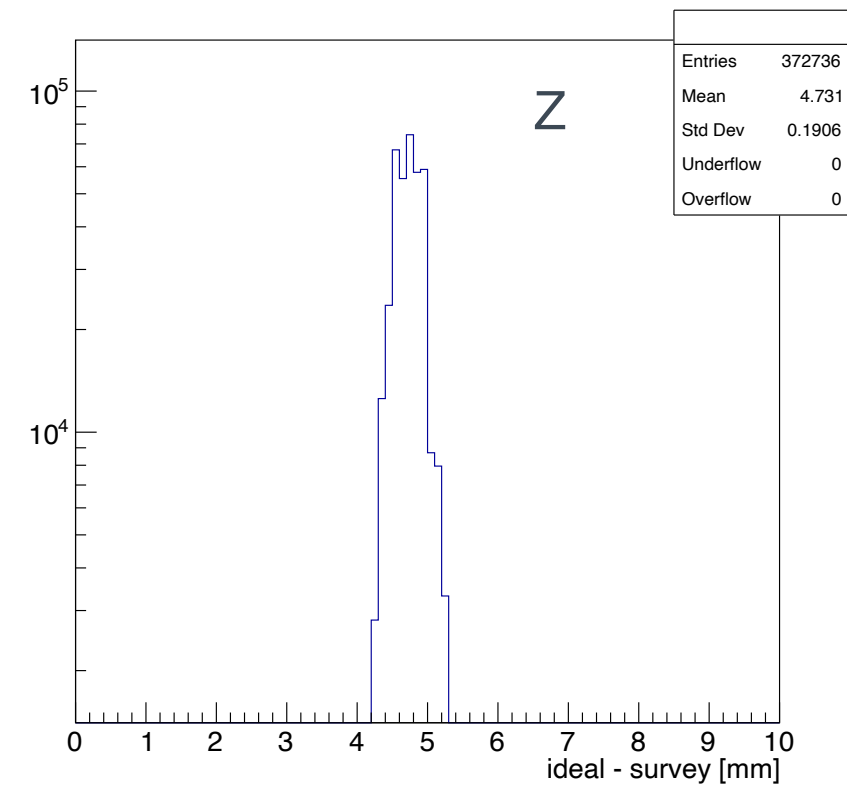
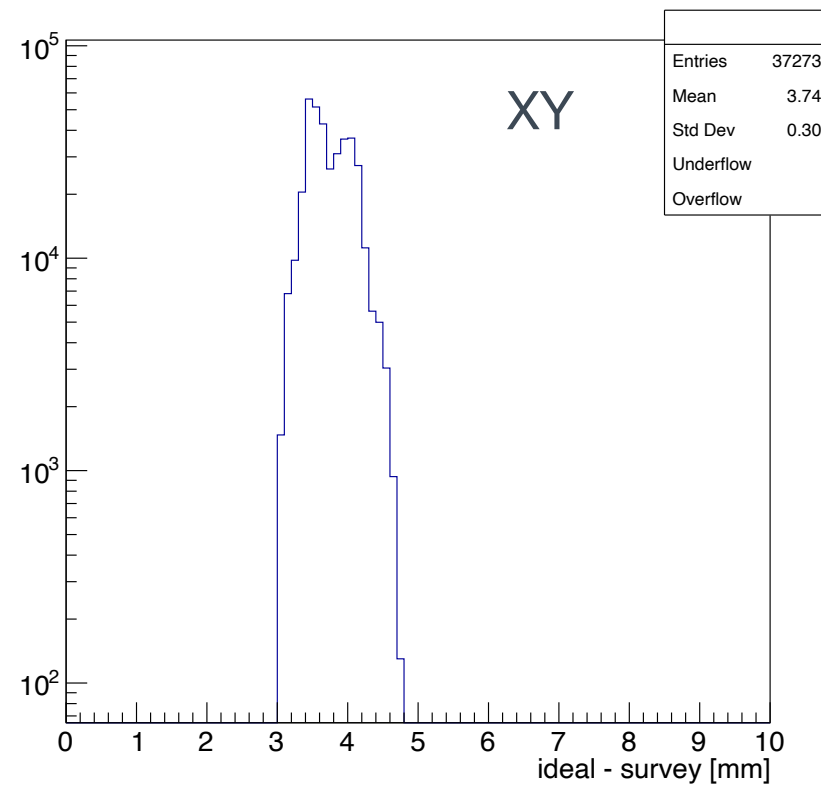
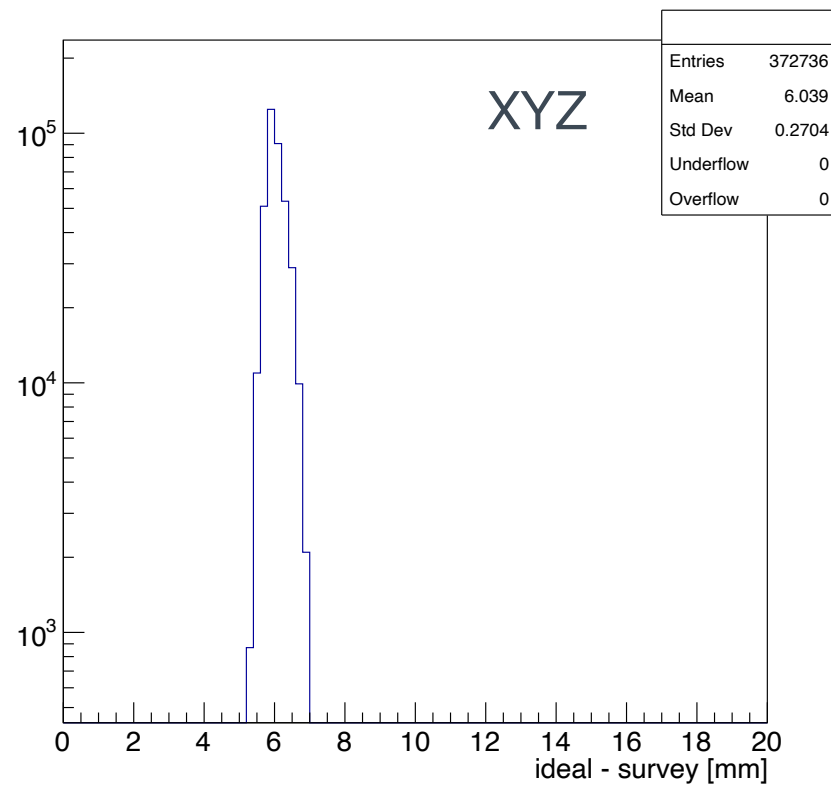
# sPEHNIX INTT - Geo. fine tuning

Cheng-Wei Shih, Chia-Ming Kuo  
National Central University

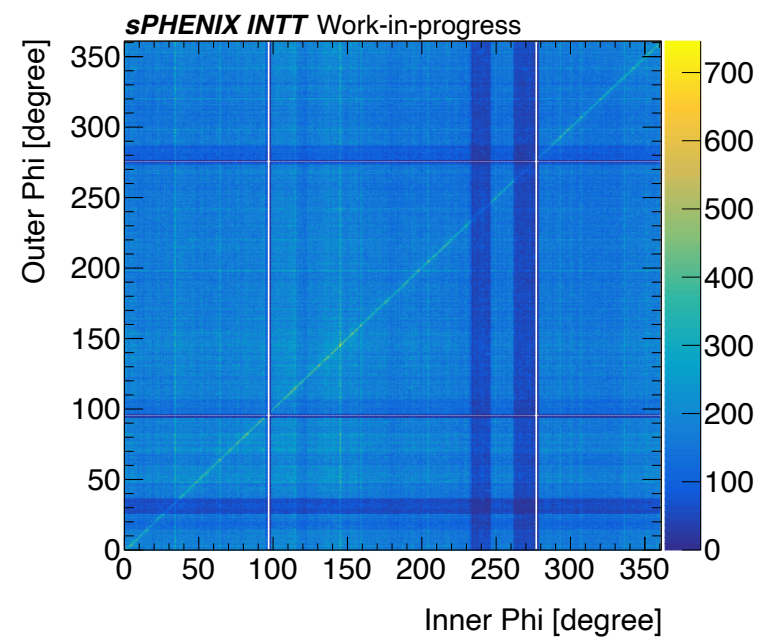


# Survey data confirmation, compare with ideal geo.

The distribution of the position discrepancies of all the channels  
Entries of the distributions : 128 channels x 26 chips x 112 half-ladders = 372,736

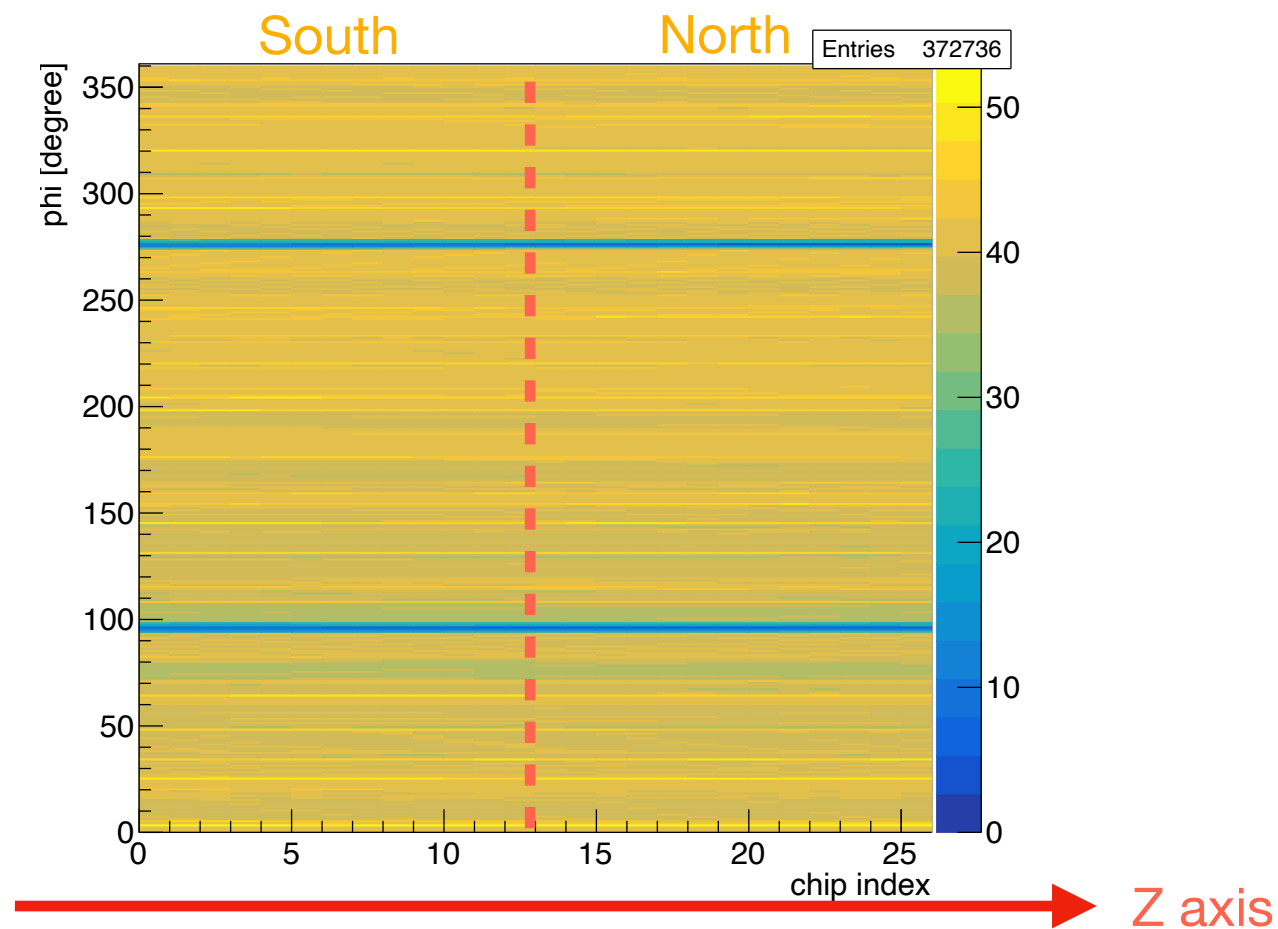
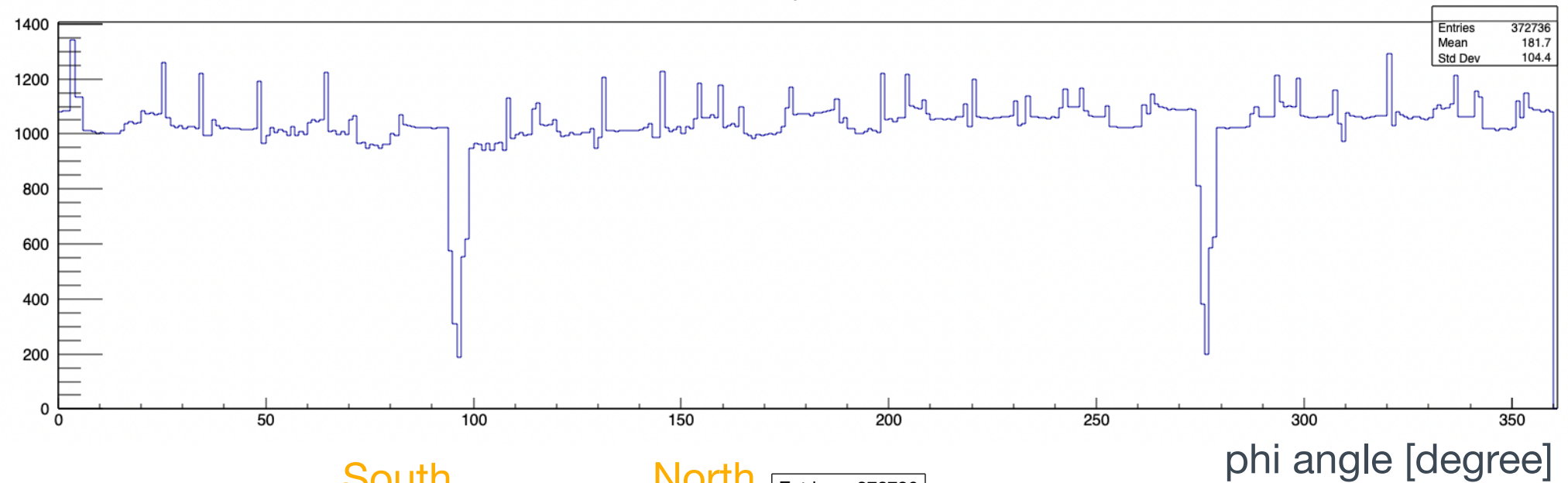
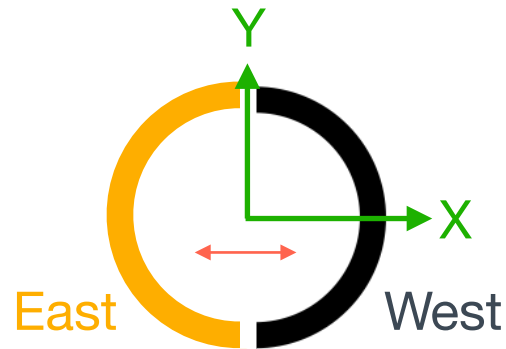


Beam run 20869  
(Private clustering)  
Clear correlation is seen



The calculation seems to be correct  
The survey data is the input from Joseph!

# Survey data confirmation, compare with ideal geo.

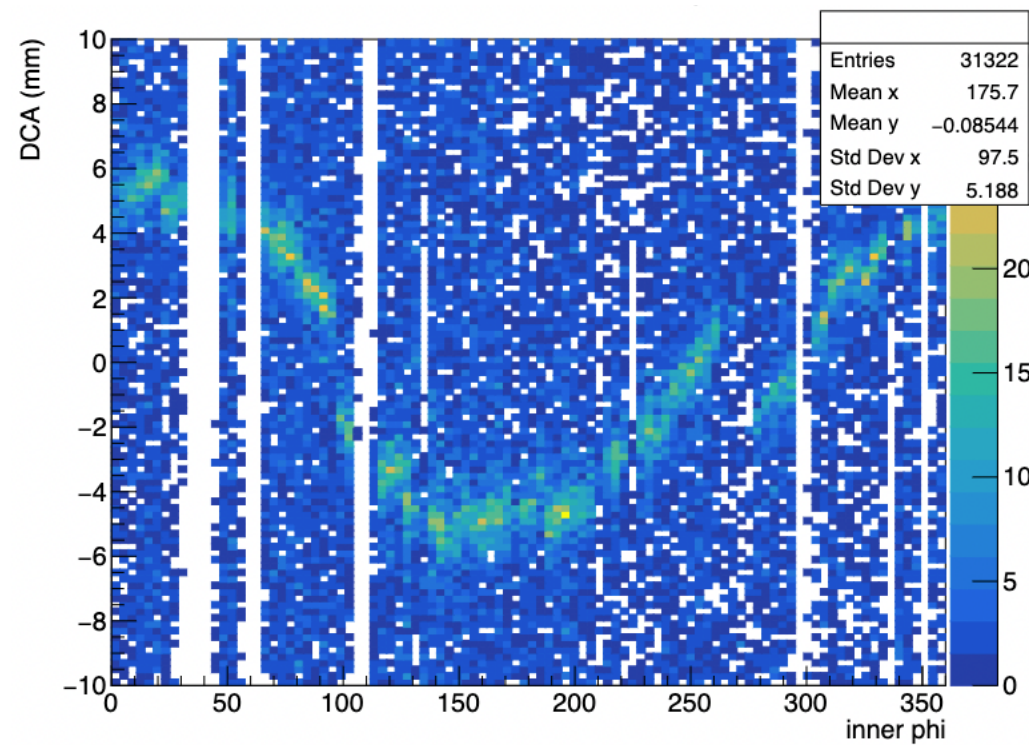


The indication that INTT halves were not closed well  
The open  $\phi$  region seems to be z-position independent

# Is the survey data closer to the true geo. ?

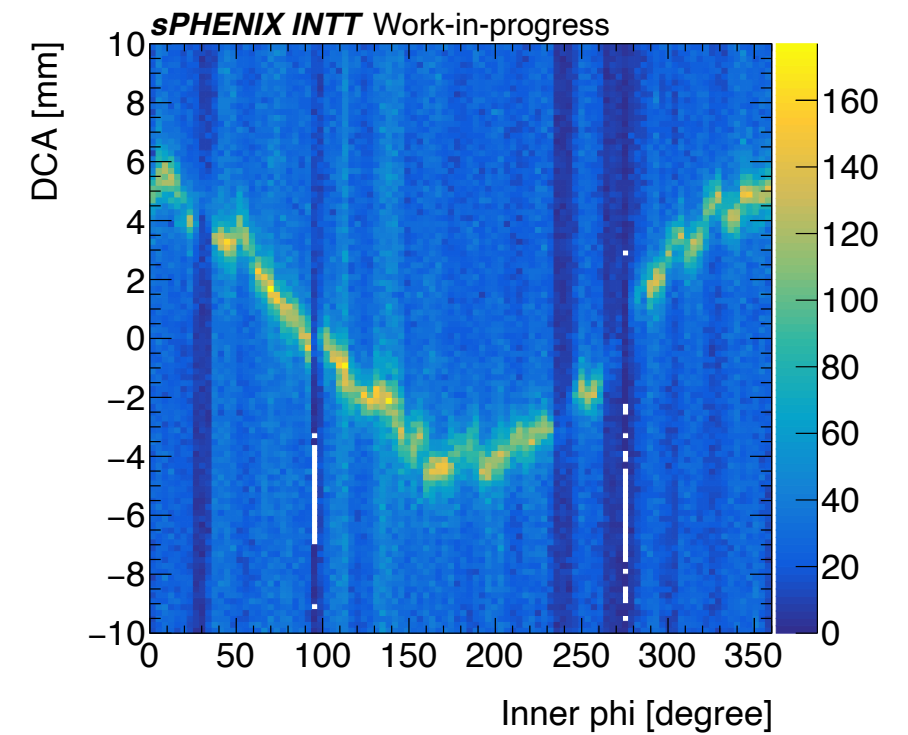
(Private clustering)

Ideal geometry

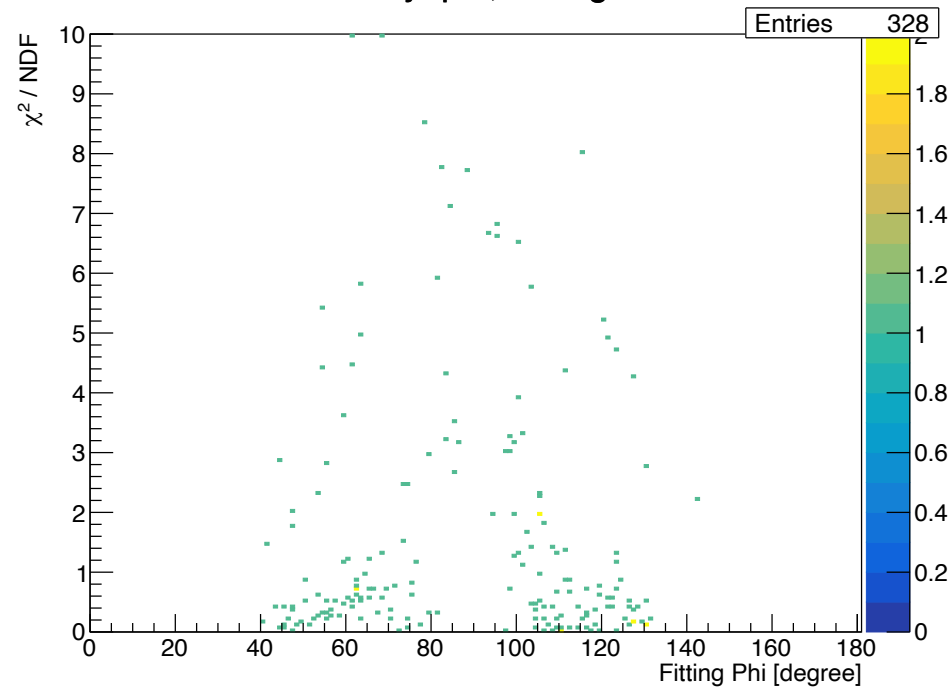


With beams

Full survey geometry

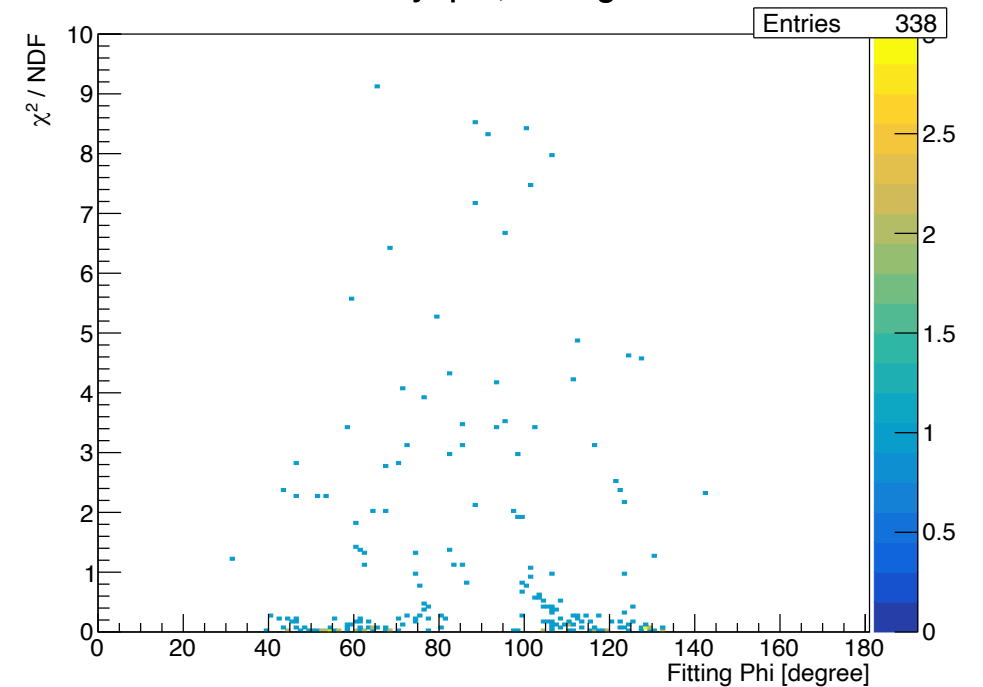


Rchi2\_xy\_phi, z range : 2



With cosmic rays

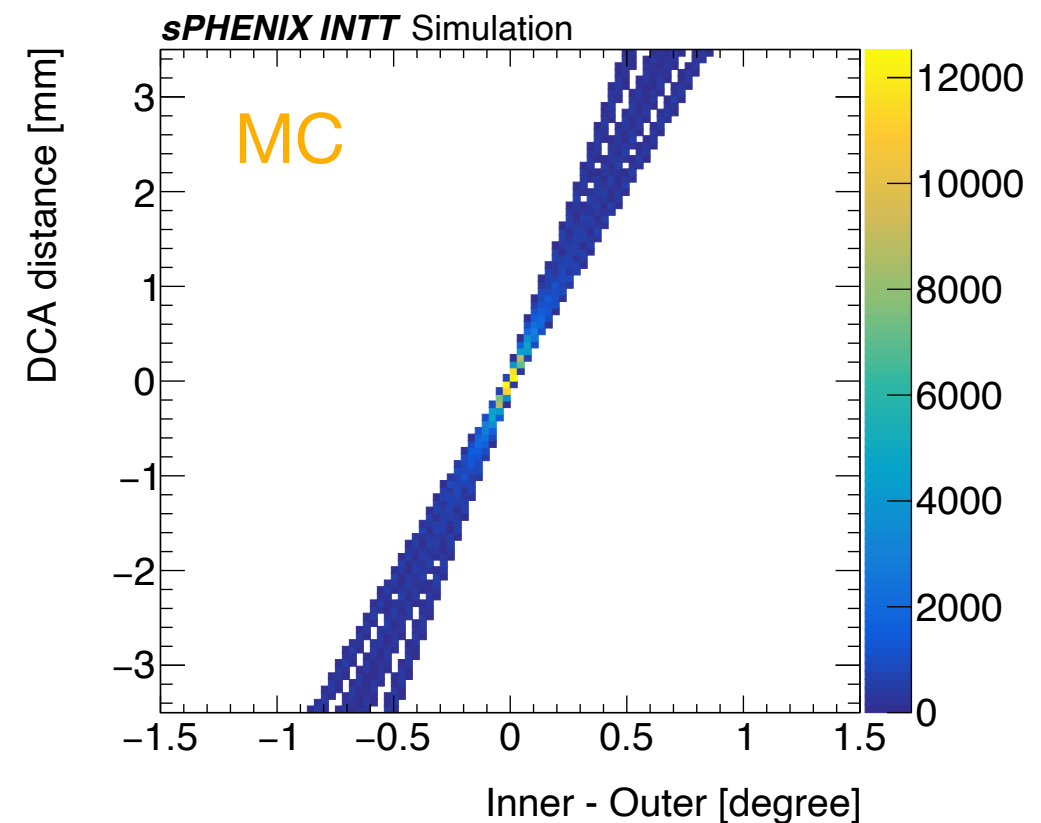
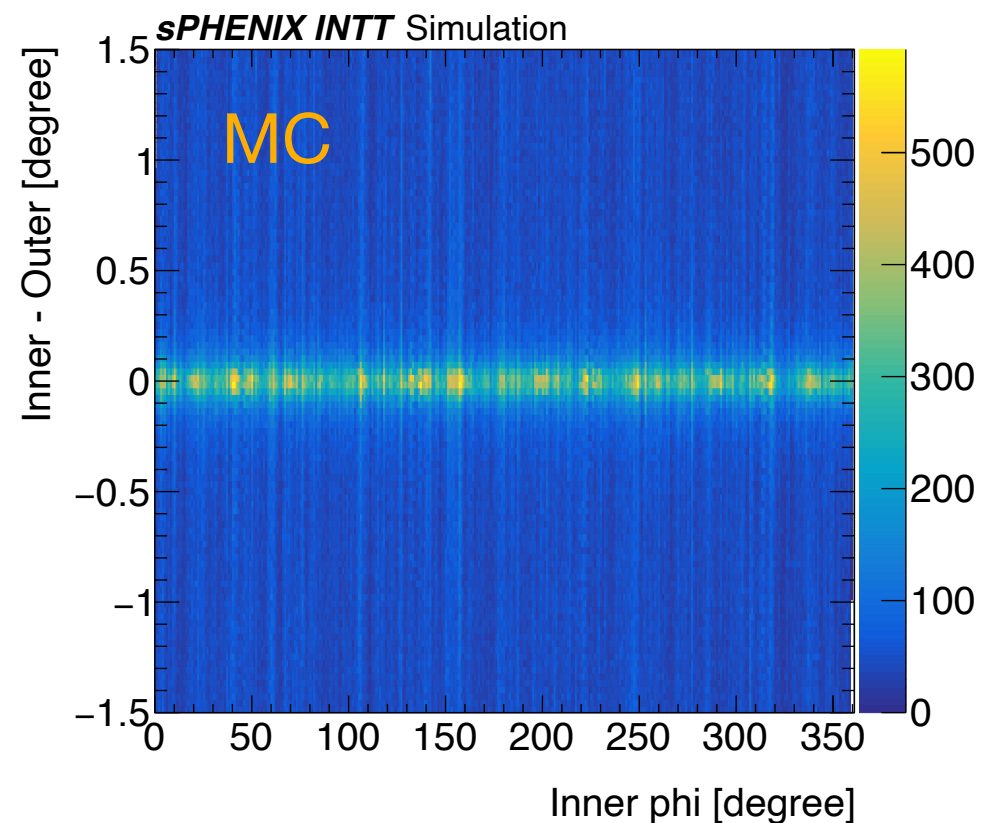
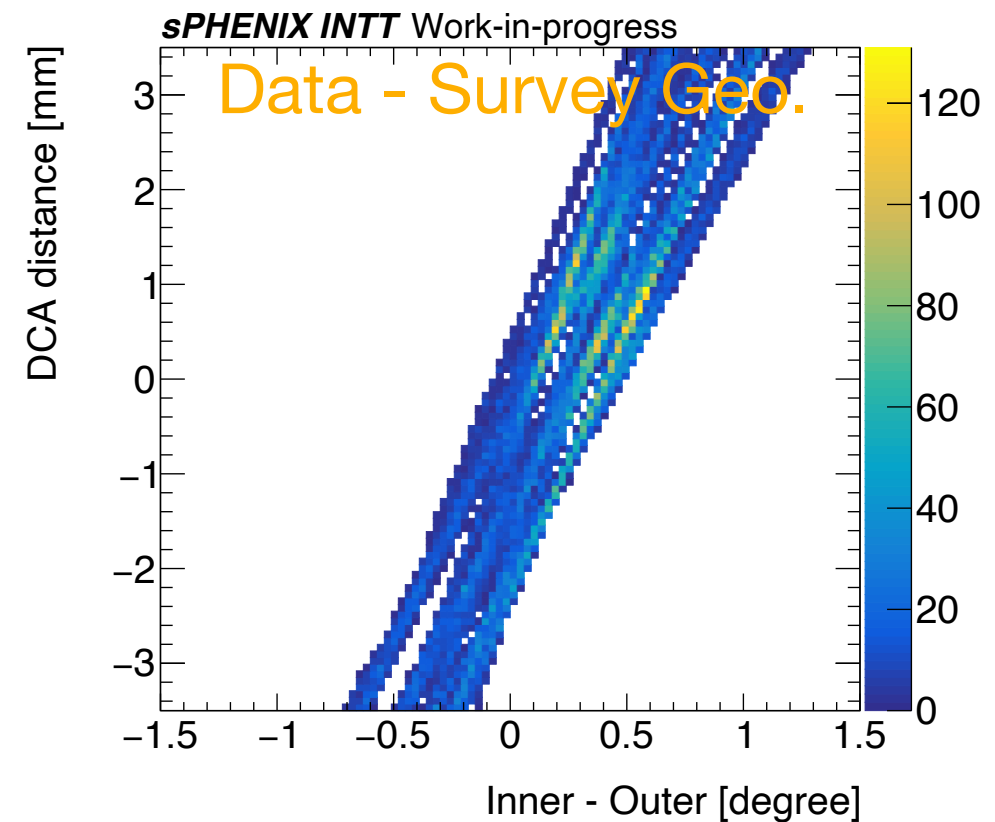
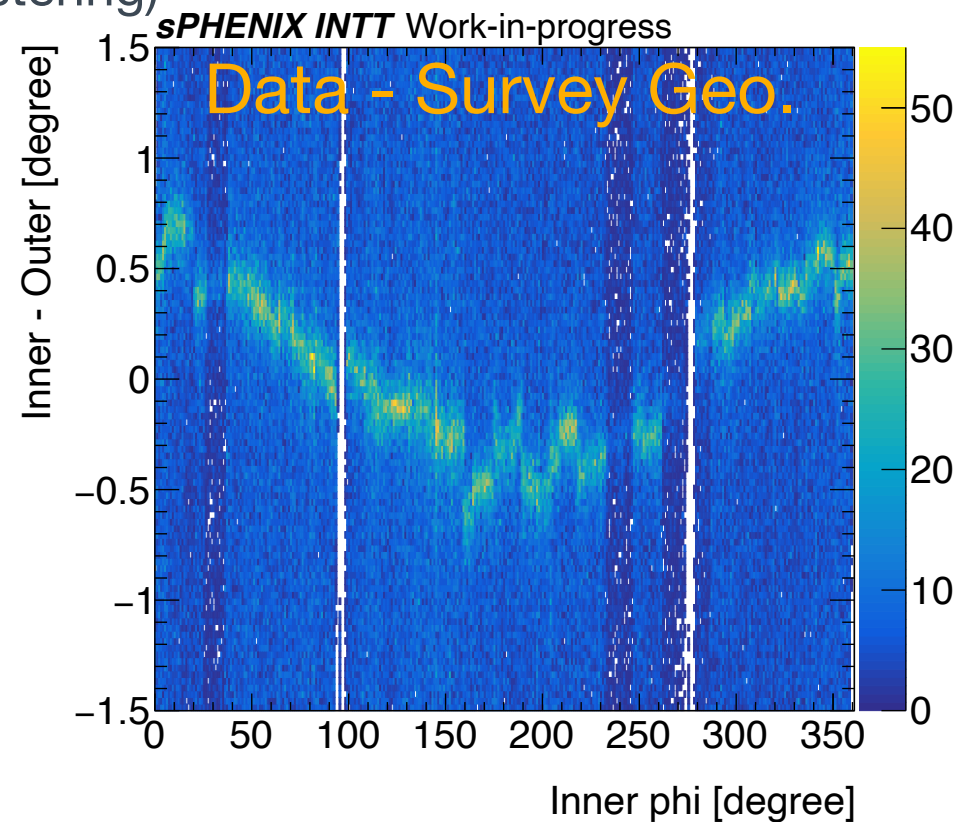
Rchi2\_xy\_phi, z range : 2



The survey geometry is closer to the true position. More studies can be developed

# Geometry comparison - survey v.s. ideal

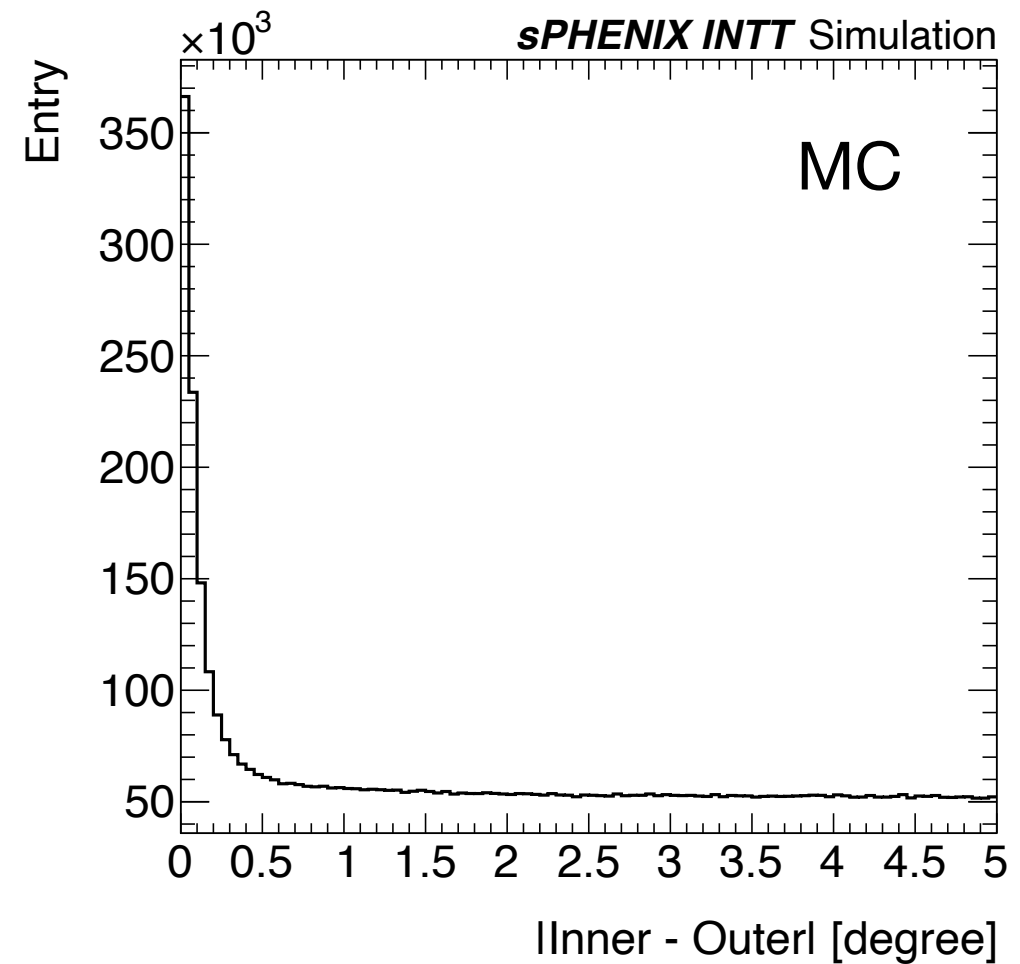
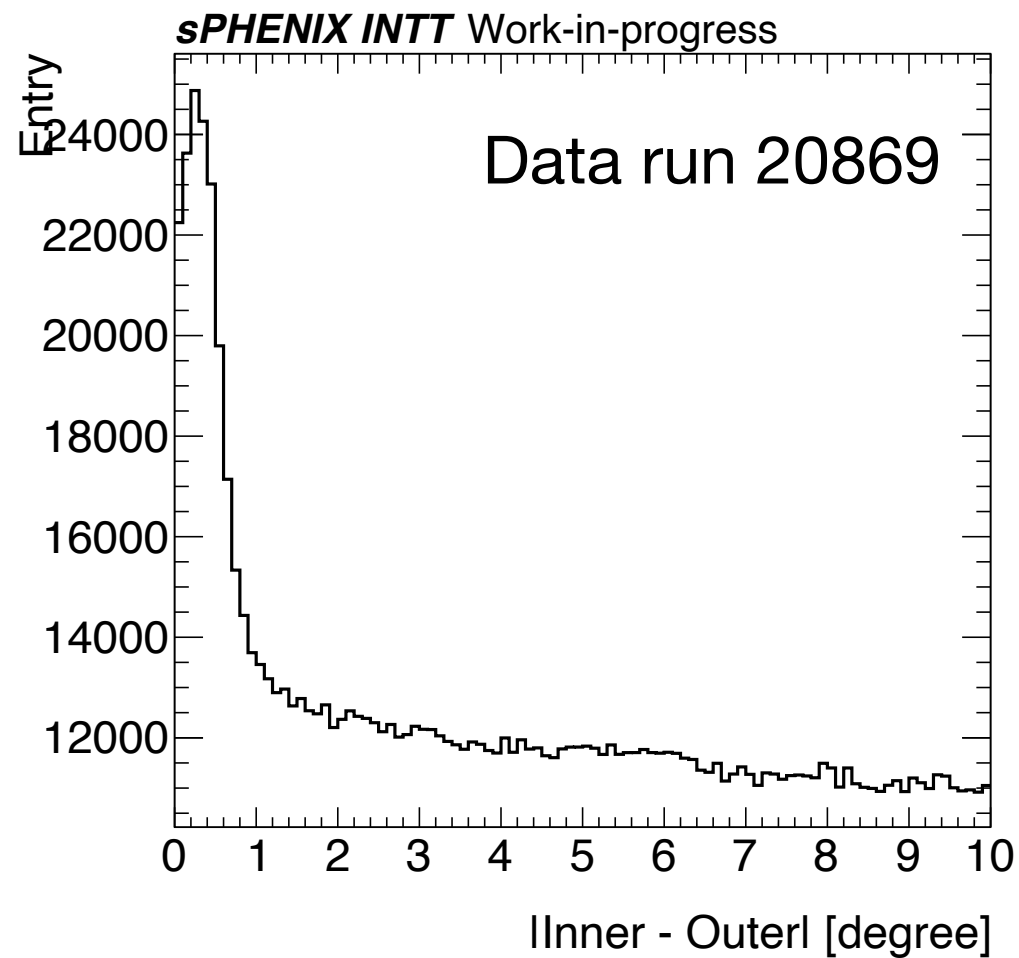
(Private clustering)



MC provides the ideals how should those correlations be if the geometry is perfectly correct

# Geometry comparison - survey v.s. ideal

(Private clustering)



MC provides the ideals how should those correlations be if the geometry is perfectly correct

- A better way to quantify the performance of the survey geometry
- Feasibility of Millepede-II package ?
  - With beams
    - Abundant statistic but only two points for each track
  - With cosmic-rays
    - Four points can be required but much less statistic
  - How to start with?
- INTT Geometry correction
  - Azimuthal angle
  - Chip Z position ?

# Backup

- The root file contains the position information of all the channels
  - SDCC : /sphenix/user/ChengWei/INTT/test\_build/survey\_data\_all\_3.32.root
  - Full survey data considered
  - With 3.32 mm correction inward to correct the stave-peek mis-consideration issue
- Tree structure
  - Total entry : 128 channels \* 26 chips \* 112 half-ladders = 372,736

|        |                 |                                                        |
|--------|-----------------|--------------------------------------------------------|
| pid    | 0 to 7          | INTT FELIX server ID (south : 0 to 3 & north : 4 to 7) |
| module | 0 to 13         | Each FELIX server has 14 half-ladders                  |
| chip   | 1 to 26         |                                                        |
| chan   | 0 to 127        |                                                        |
| x      | mm              | Given by survey data                                   |
| y      | mm              |                                                        |
| z      | mm              |                                                        |
| phi    | 0 to 360 degree | Calculated by x and y                                  |