

# Simulation update

Problem:

Yields deviation between

Packing fraction runs 3503,3574,3864

# Yields table

Runs	Yields	Beam x	Beam y	Beam th	Beam ph
3503	592401	2.09	1.05	0.06082	0.00334
3574	719725	2.00	0.49	0.06011	0.00090
3864	760919	0.84	0.69	0.06083	0.00070

Note: Beam th and Beam ph in Pengjia coordinate.

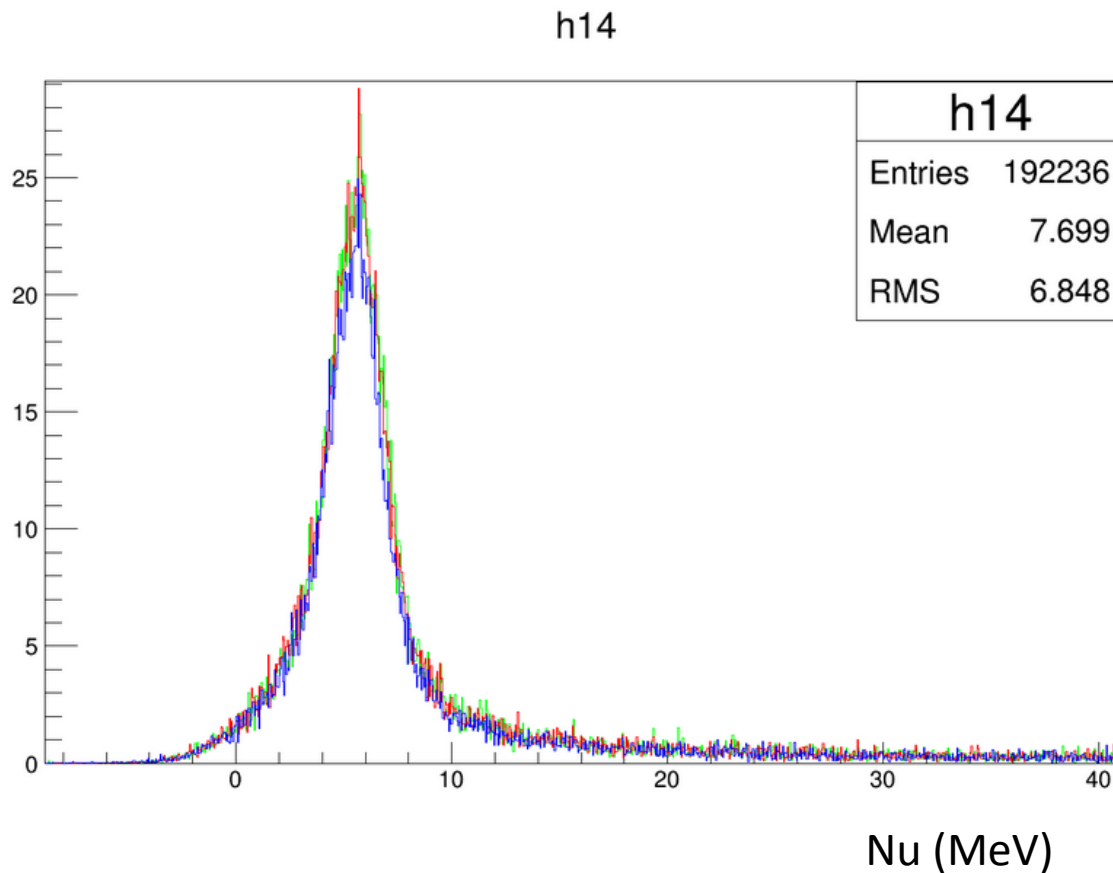
Material 7  
Packing fraction runs  
2.2GeV 2.5T Trans  
Yields ratio:  
0.778:0.946:1

Electron cuts applied  
Thank Melissa!

Look at the Yields dependence on beam position and angle  
Simulate the NH3 target

# Simulation

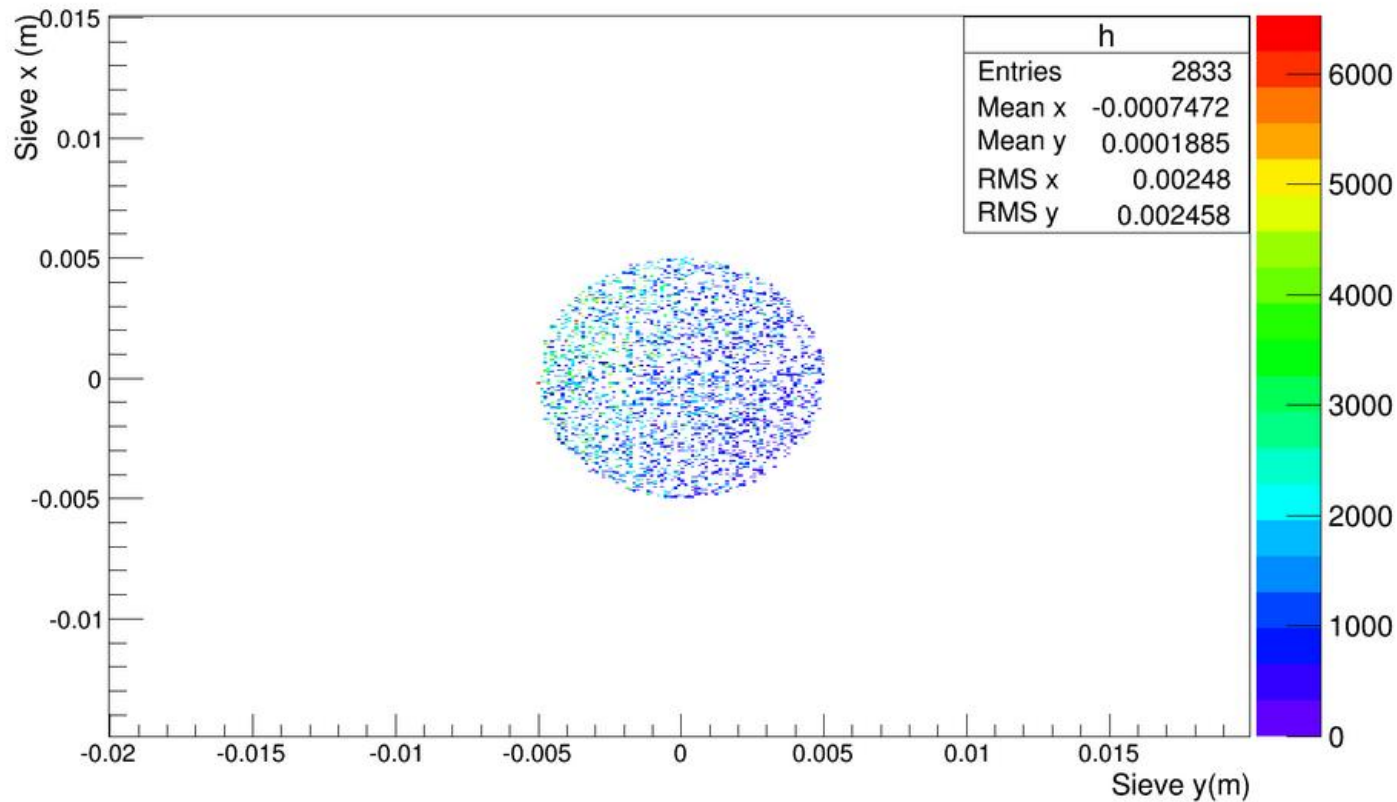
- Type 1 event generator
- Average beam position input + **same** incident angle



- Simulated distribution
- Green:  
Run 3503
- Red:  
Run 3574
- Blue:  
Run 3864
- Simulate Yields ratio:  
**1.000:0.990:0.893**
- Exp. Yields ratio:  
**0.734:0.946:1.000**

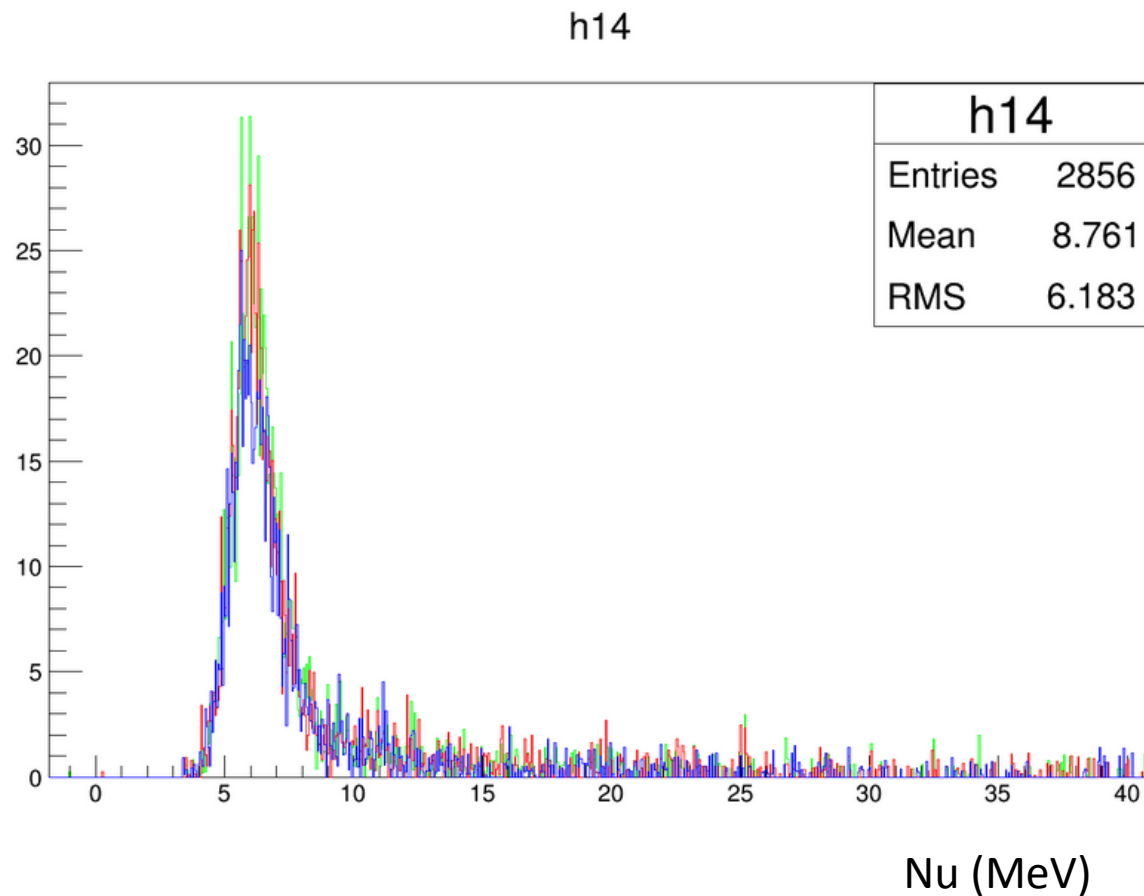
# Simulation

- Type 1
- Average Beam position input + **same** incident angle



# Simulation

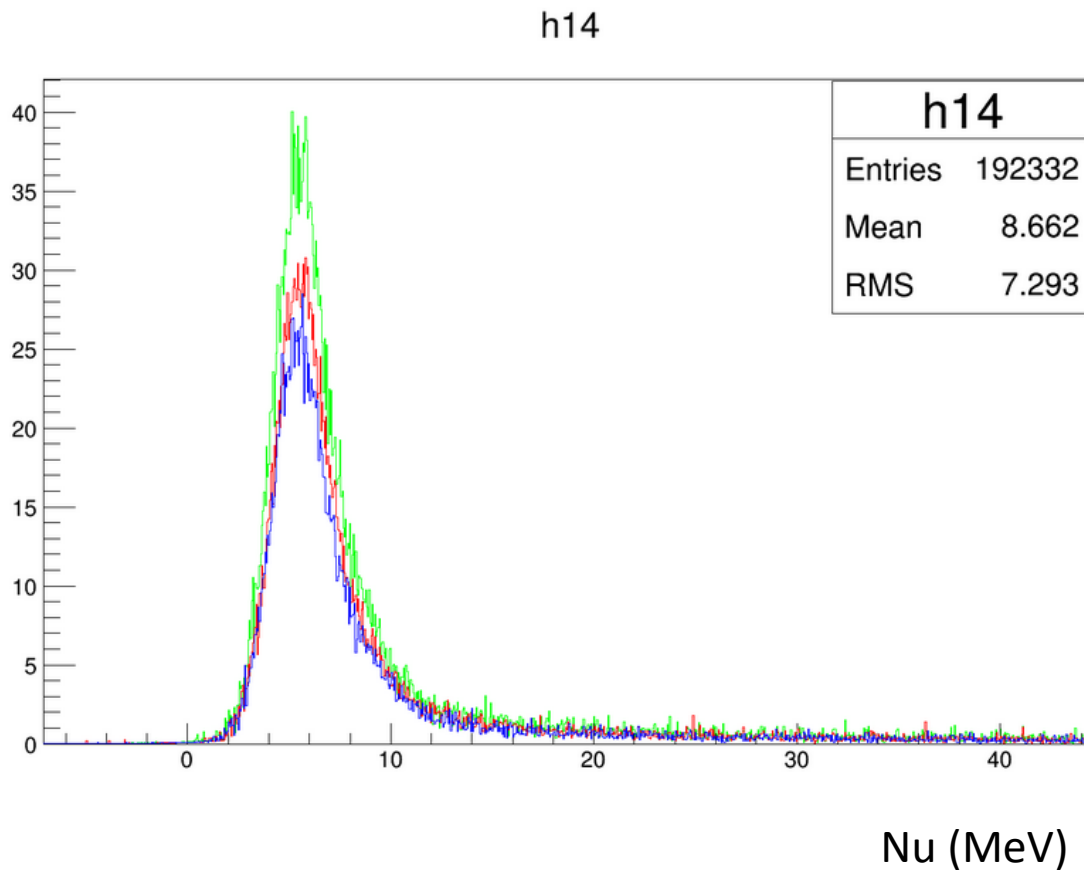
- Type 1
- Look from the Hole



- Simulated distribution
- Green:  
Run 3503
- Red:  
Run 3574
- Blue:  
Run 3864
- Simulate Yields ratio:  
**1.000:0.971:0.851**
- Exp. Yields ratio:  
**0.734:0.946:1.000**

# Simulation

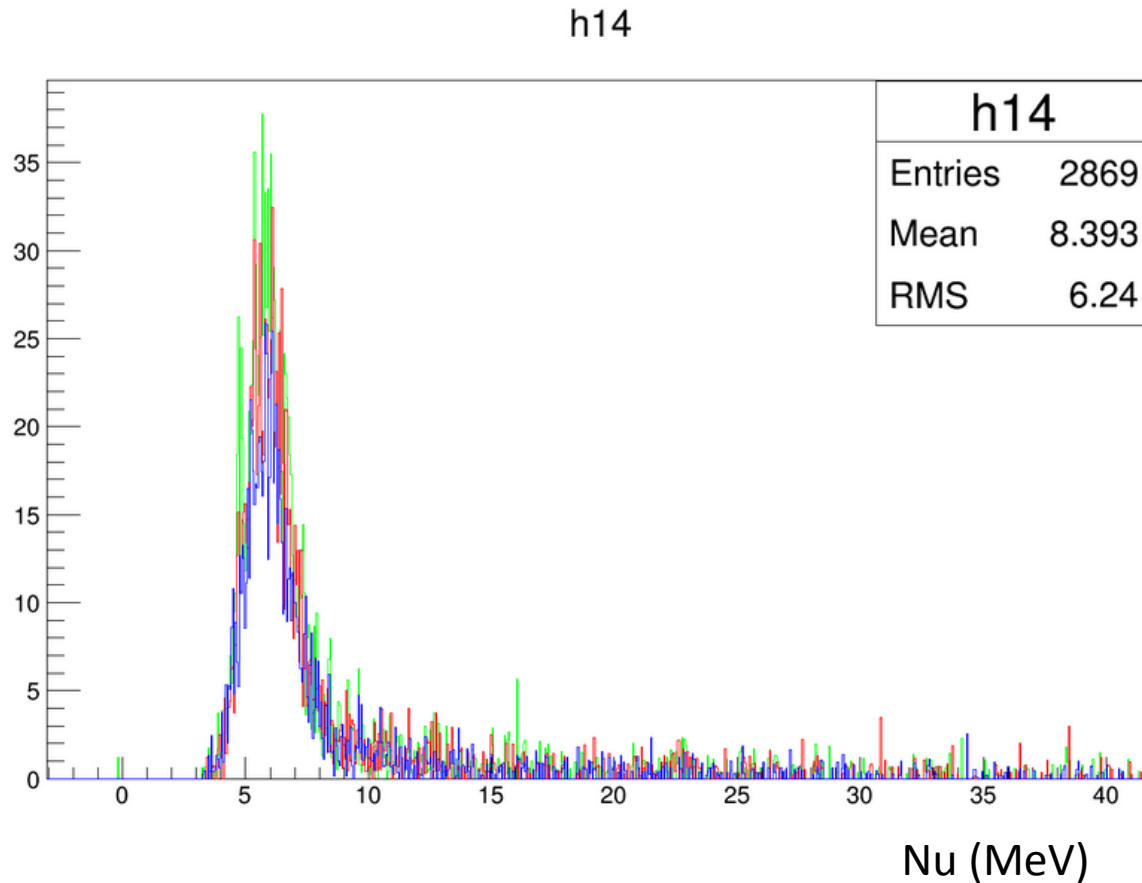
- Type 2 event generator
- Average beam position + Average incident angle input



- Simulated distribution
- Green:  
Run 3503
- Red:  
Run 3574
- Blue:  
Run 3864
- Simulate Yields ratio:  
**1.000:0.798:0.700**
- Exp. Yields ratio:  
**0.734:0.946:1.000**

# Simulation

- Type 2 event generator
- Average beam position + Average incident angle input
- Look from Hole



- Simulated distribution
- Green: Run 3503
- Red: Run 3574
- Blue: Run 3864
- Simulate Yields ratio:  
**1.000:0.849:0.703**
- Exp. Yields ratio:  
**0.734:0.946:1.000**

# Summary

- The yields have strong dependence on incident beam pos and angle. Check package!
- Need to check the pos and angle?

Runs	Yields	Beam x	Beam y	Beam th	Beam ph
3503	592401	2.09	1.05	0.06082	0.00334
3574	719725	2.00	0.49	0.06011	0.00090
3864	760919	0.84	0.69	0.06083	0.00070

$$beam\_x_{3503} > beam\_x_{3574} > beam\_x_{3864} \quad \longrightarrow$$

$$\theta\_scatt_{3503} < \theta\_scatt_{3574} < \theta\_scatt_{3864} \quad \longrightarrow$$

$$XS_{3503} > XS_{3574} > XS_{3864}$$

The same effect from beam angle  $beam\_ph$ ,  $\tan(beam\_ph)=dx/dz$  in lab