INTT cluster size in beam test @ ELPH

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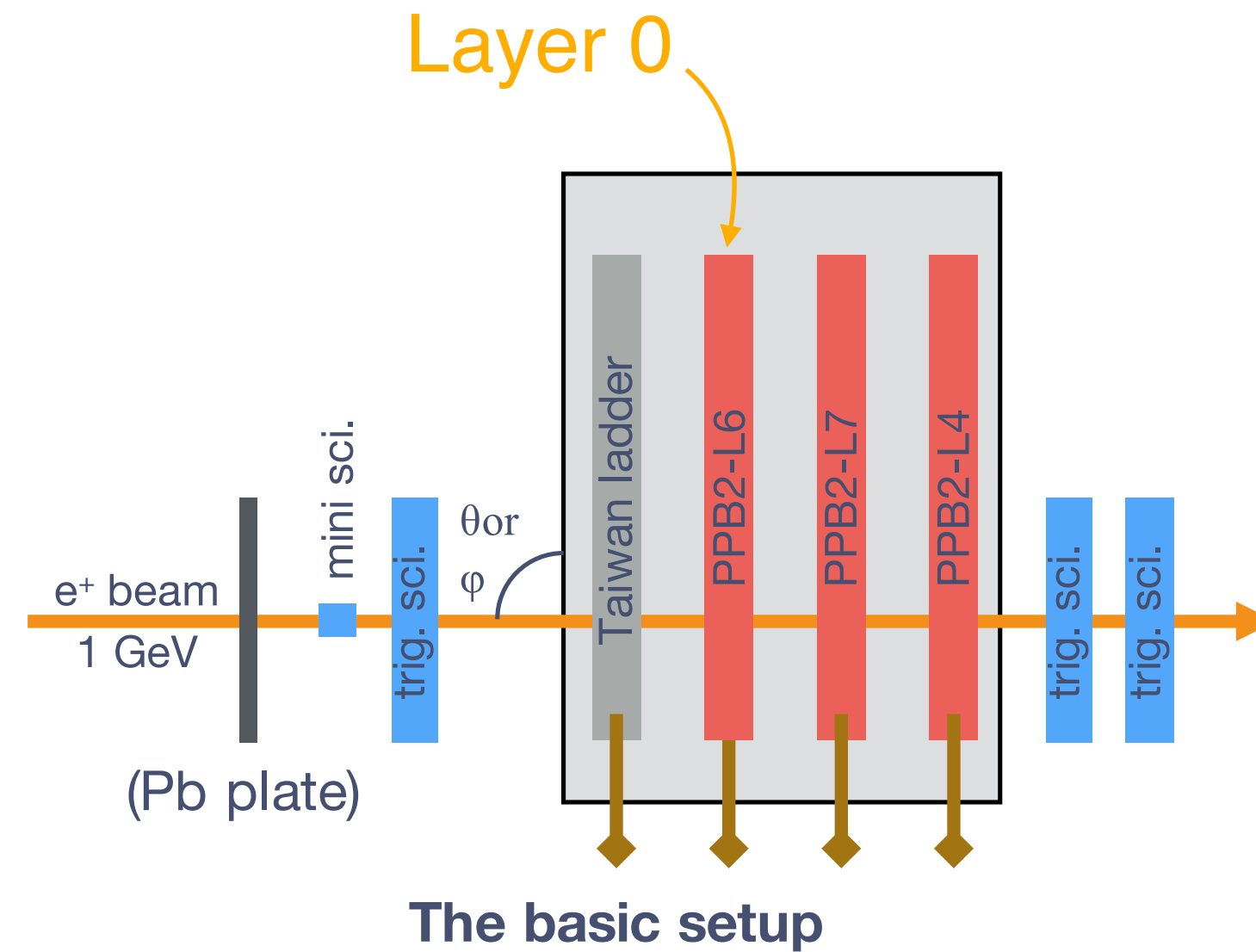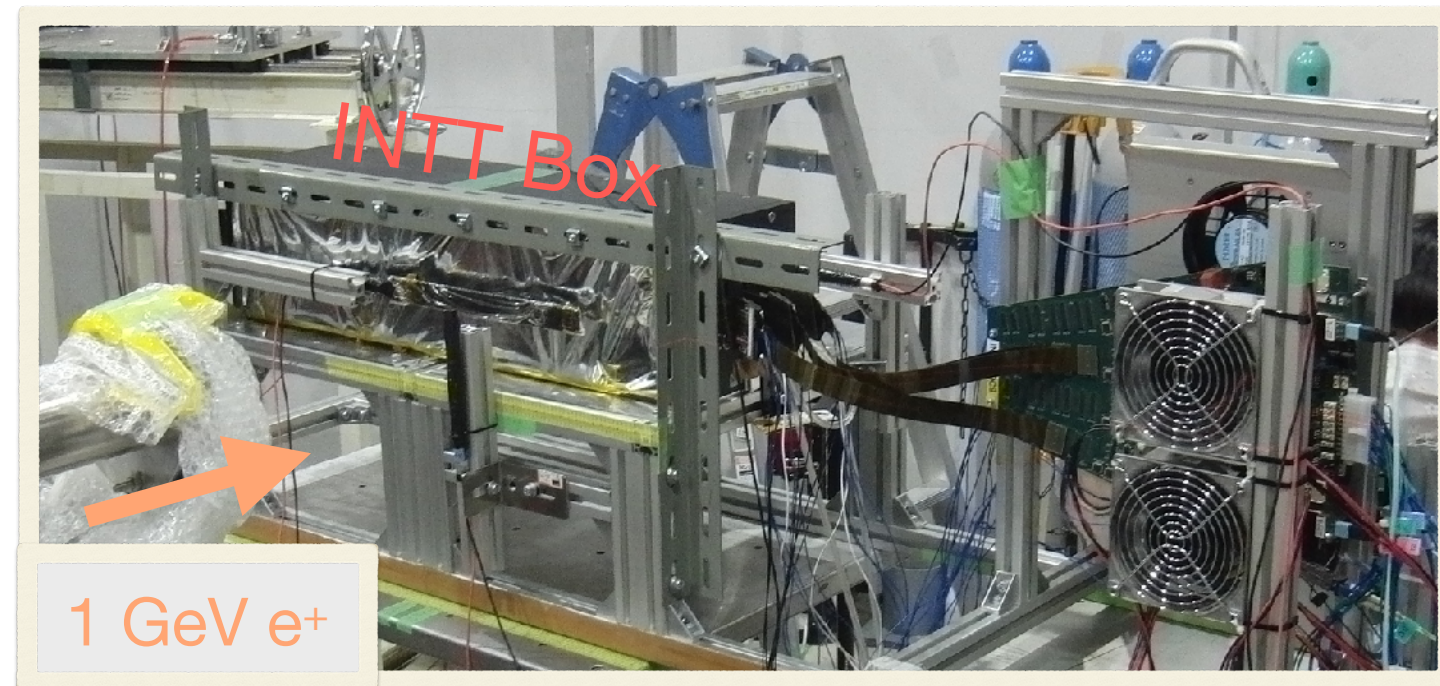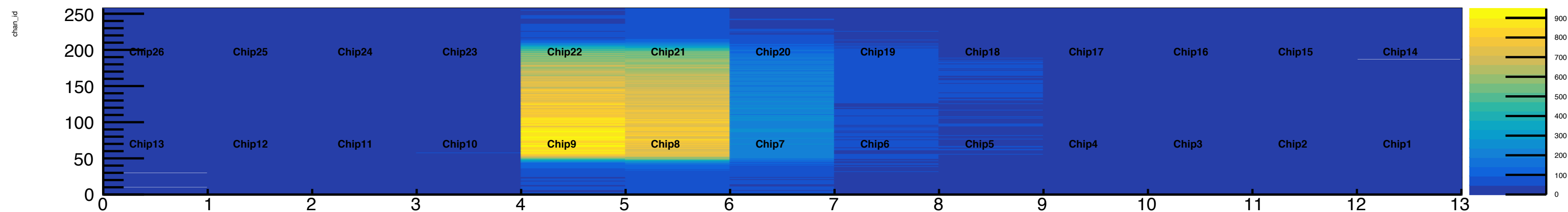
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INTT Beam Test @ ELPH

- Beam : Positron beam with the peak energy of ~ 800 MeV

- Configuration : 3 layers of INTT ladders + 2 scintillators (trigger)
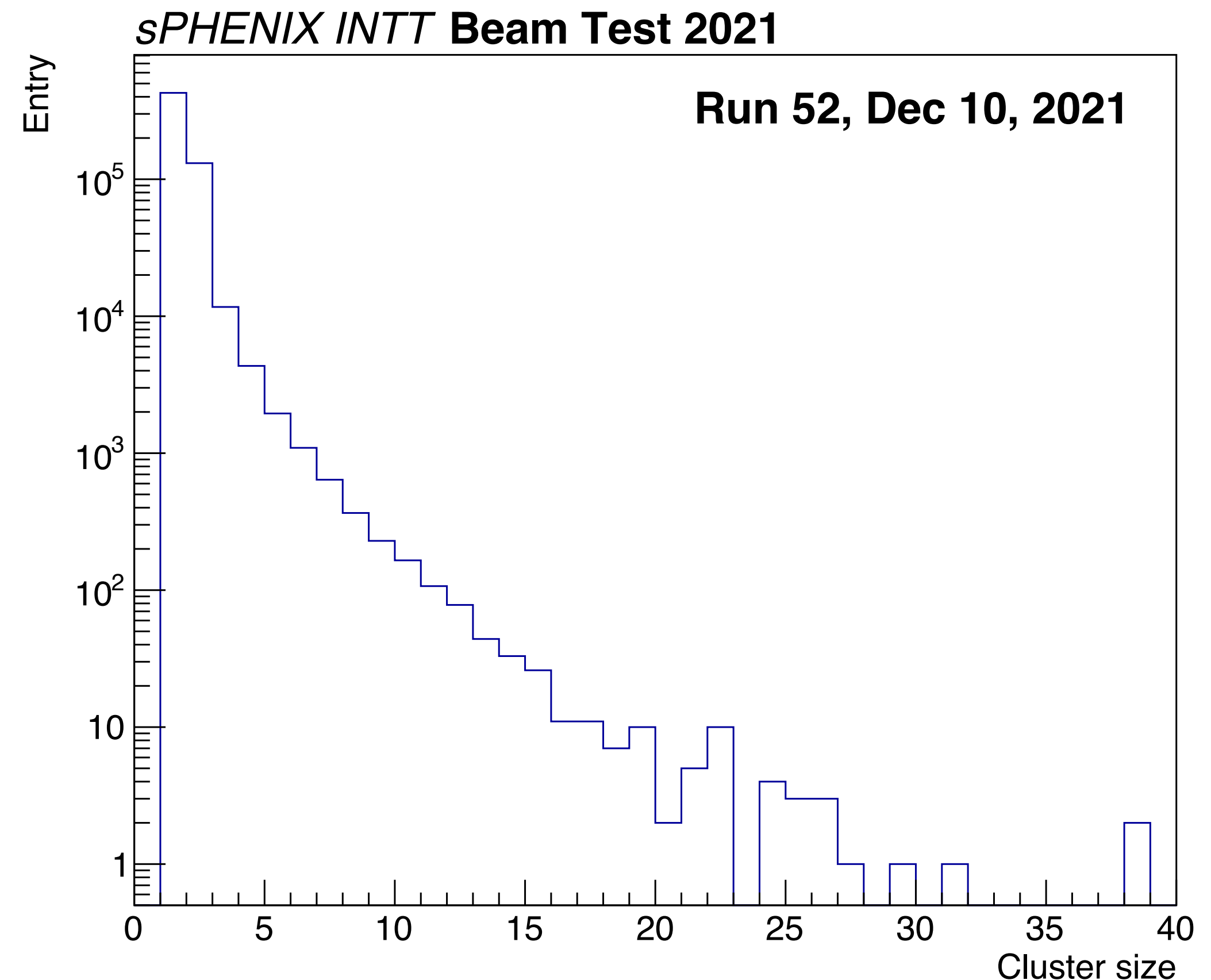
- Bias voltage : 50 V

Run 52 Hit map

Cluster size distribution - inclusive

- Directory: SDCC:/sphenix/user/ChengWei/INTT/ELPH_BeamTest2021
- The raw data post clustering : **cluster_information_offset-0.0000_adcinfo_NoCamac.root**
- The histograms of cluster-size distributions: **cluster_size.root**
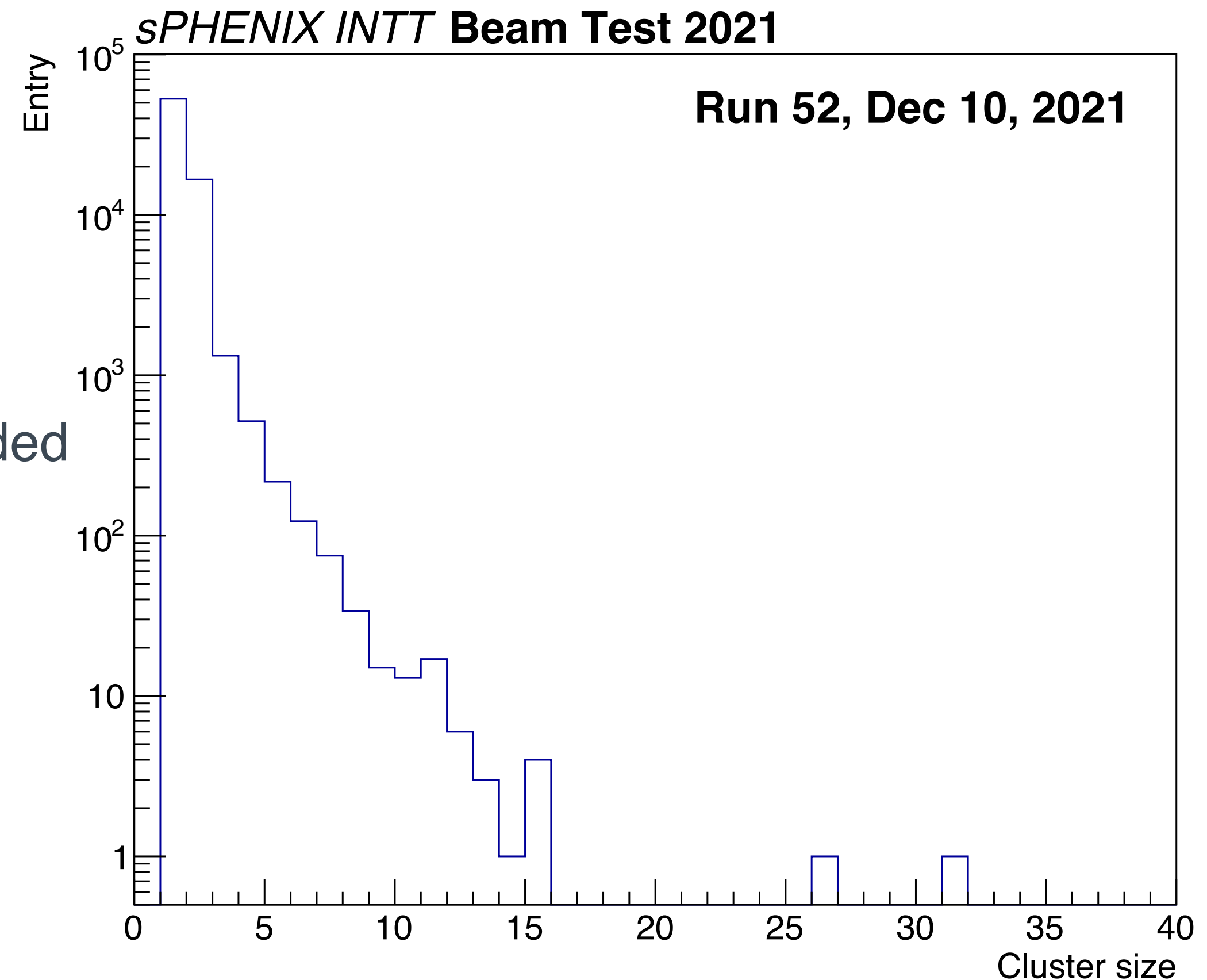- **Cluster φ shown only, cluster Z size was fixed at 1**

- The "**inclusive_clu_size**" in the cluster_size.root
- Inclusive, all the clusters were considered

Cluster size distribution - single column

- Directory: SDCC:/sphenix/user/ChengWei/INTT/ELPH_BeamTest2021
- The raw data post clustering : **cluster_information_offset-0.0000_adcinfo_NoCamac.root**
- The histograms of cluster-size distributions: **cluster_size.root**
- **Cluster φ shown only, cluster Z size was fixed at 1**

- The "**layer0_col8_clu_size**" in the cluster_size.root
- The clusters with **layerID 0** and **columnID 8** were included

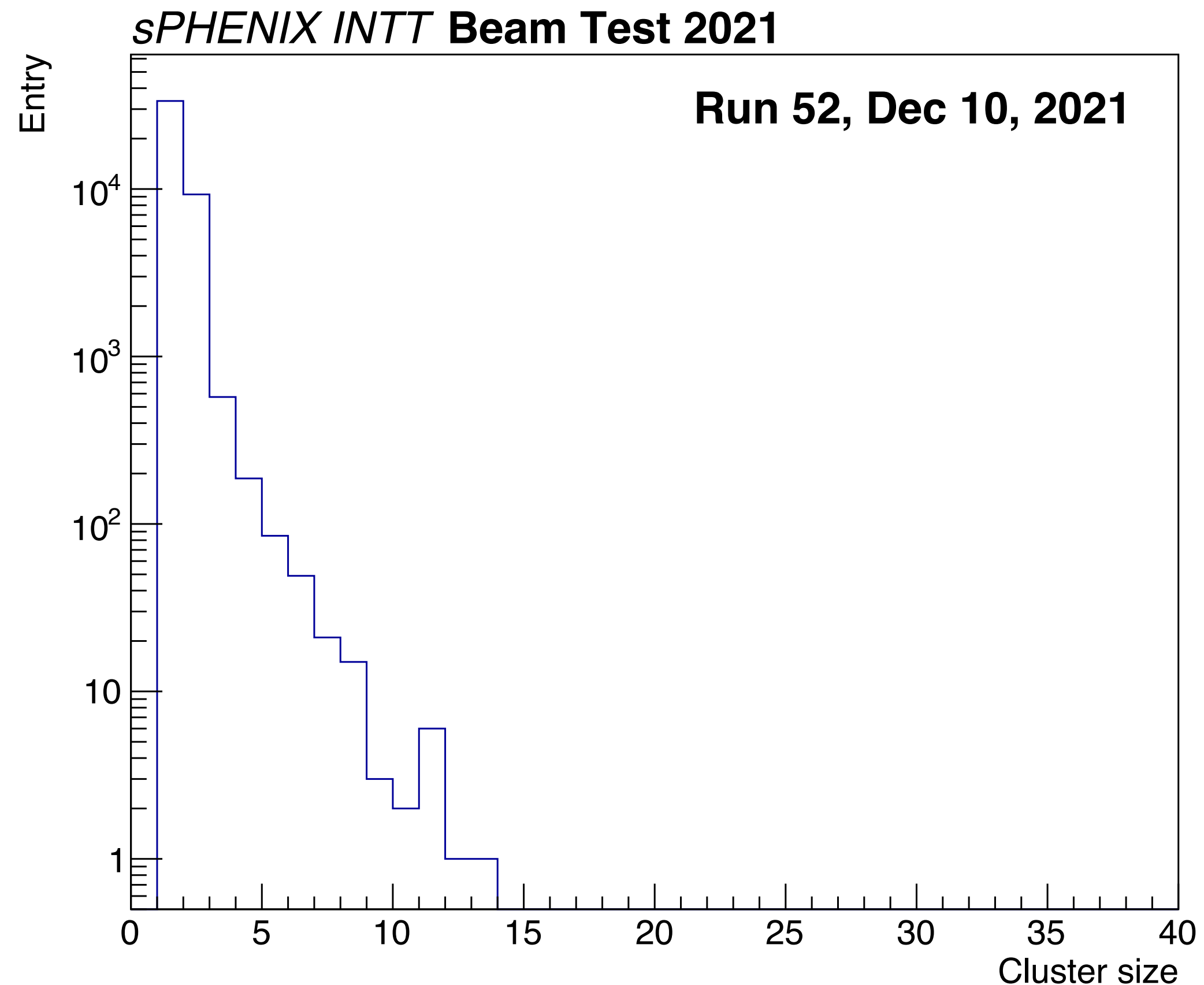*sPHENIX INTT* **Beam Test 2021**

Run 52, Dec 10, 2021

Cluster size distribution - tight

- Directory: SDCC:/sphenix/user/ChengWei/INTT/ELPH_BeamTest2021
- The raw data post clustering : **cluster_information_offset-0.0000_adcinfo_NoCamac.root**
- The histograms of cluster-size distributions: **cluster_size.root**
- **Cluster φ shown only, cluster Z size was fixed at 1**

- The "**tight_layer0_col8_clu_size**" in the cluster_size.root
- Requirement:
  - Single cluster in each layer
  - All the clusters in column 8
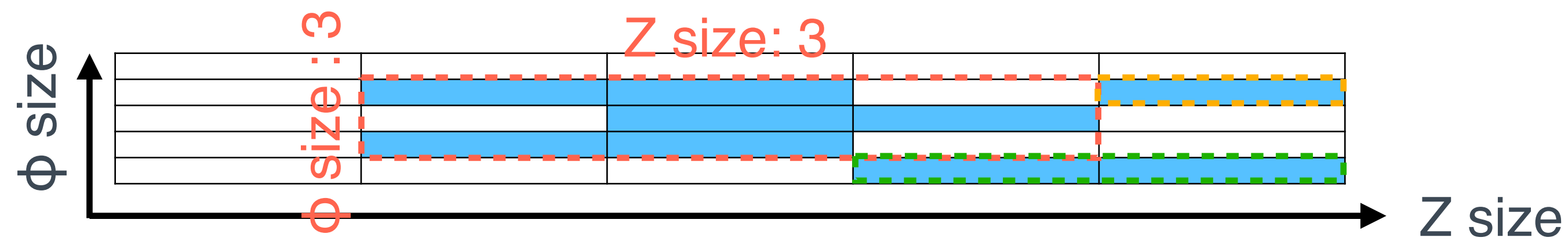 - The clusters with **layerID 0** were filled

The selections picked up the clusters with z size = 1 even if we enable the cluster-z-size clustering

May be better to use this one to do the comparison, same selections can be applied in F4A INTT G4

sPHENIX INTT **Beam Test 2021**

Run 52, Dec 10, 2021

Cluster size distribution - inclusive

- Directory: SDCC:/sphenix/user/ChengWei/INTT/ELPH_BeamTest2021
- The raw data post clustering : **cluster2D_information_offset-0.0000_adcinfo_NoCamac.root**
- The histograms of cluster-size distributions: **cluster2D_size.root**
- **2D clustering, Z size was not fixed at 1 (require exact adjacent hit in Z)**
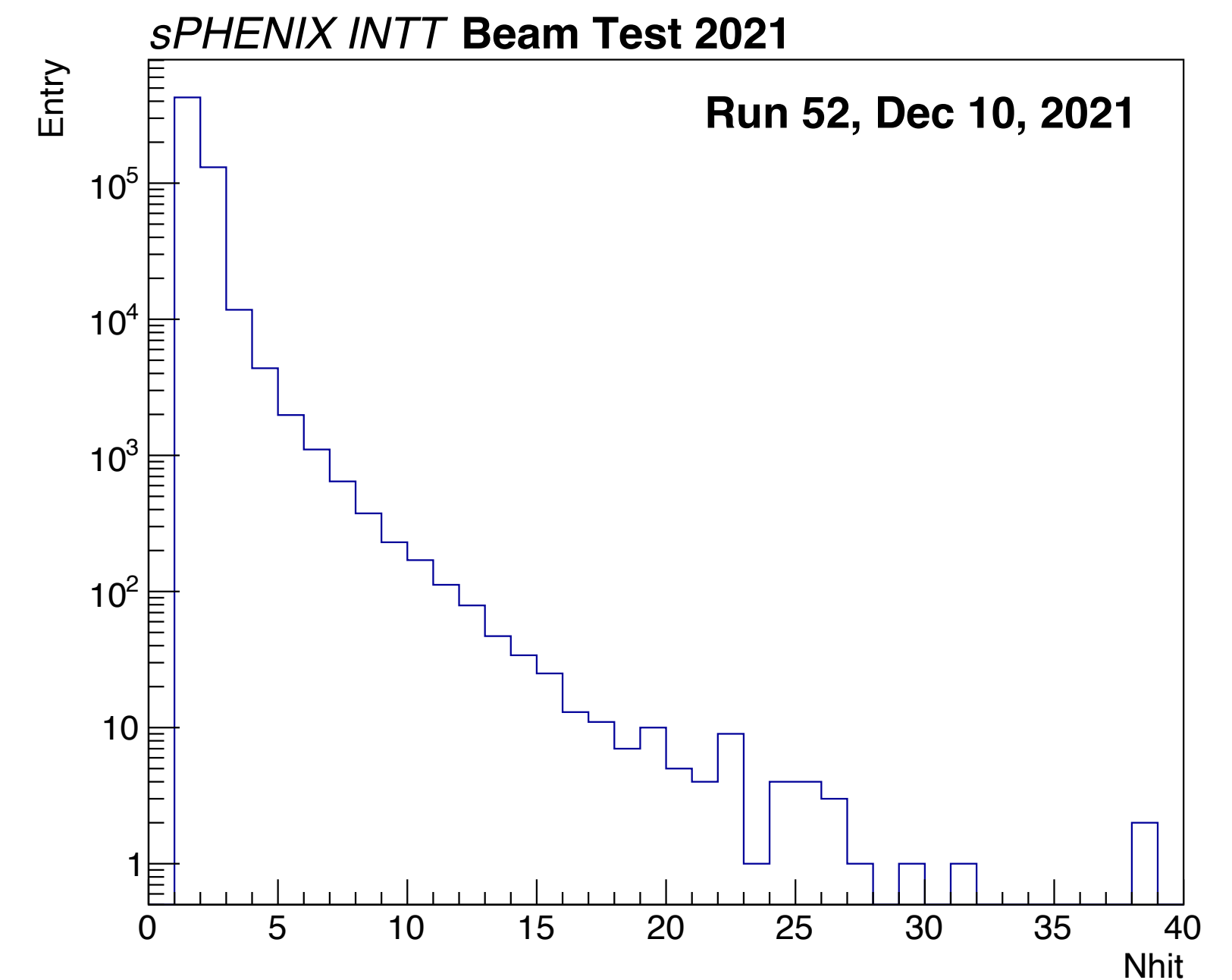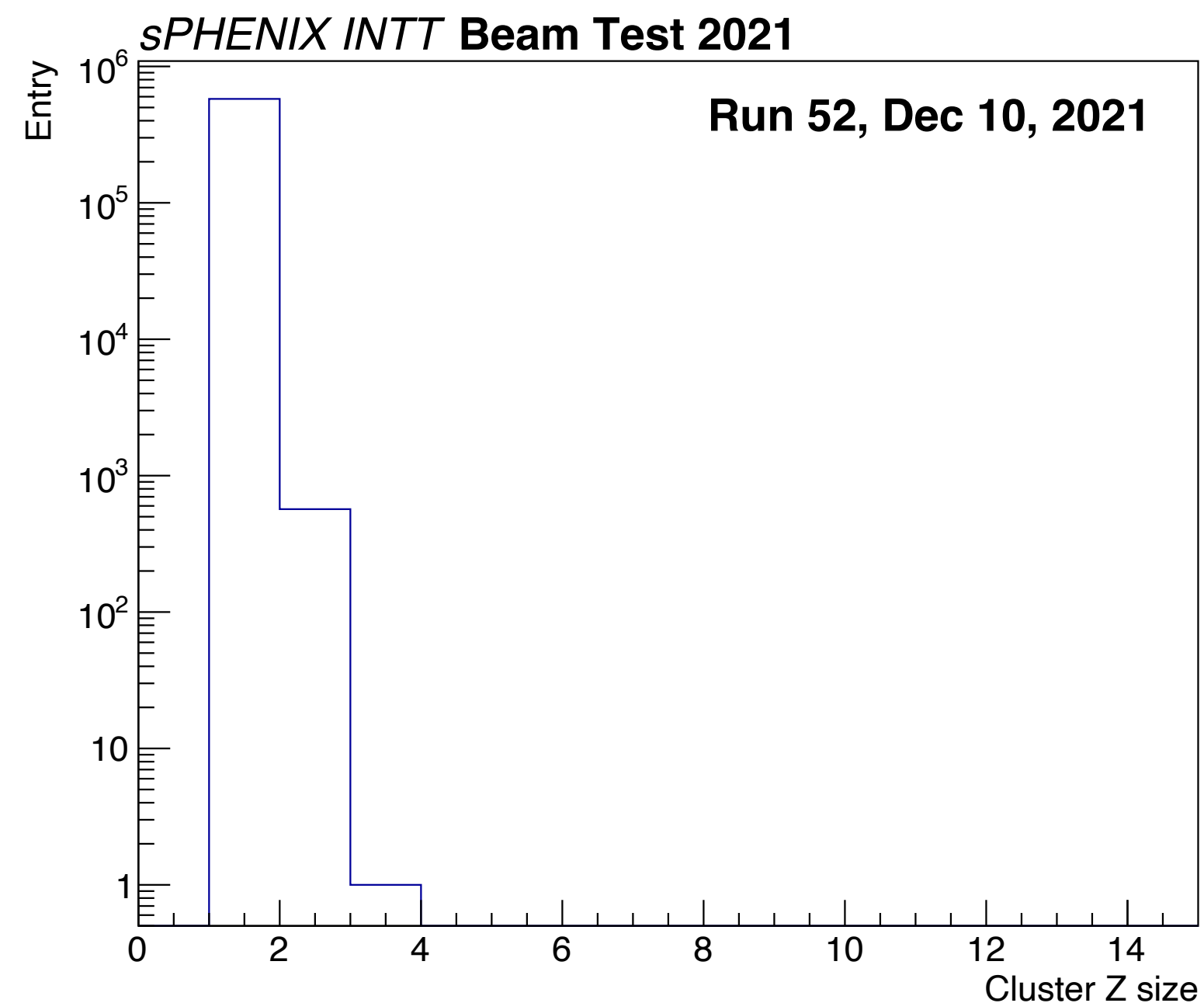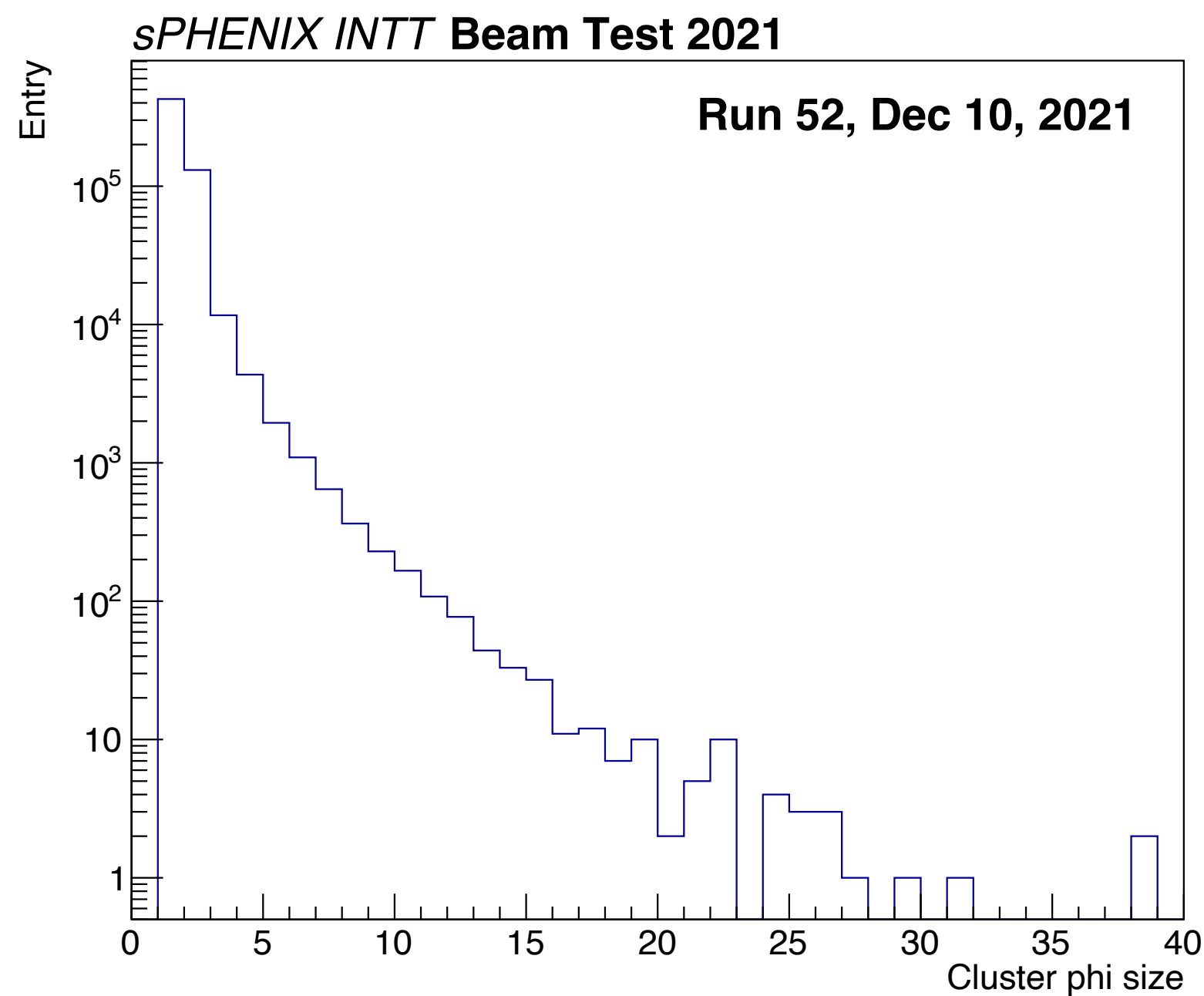

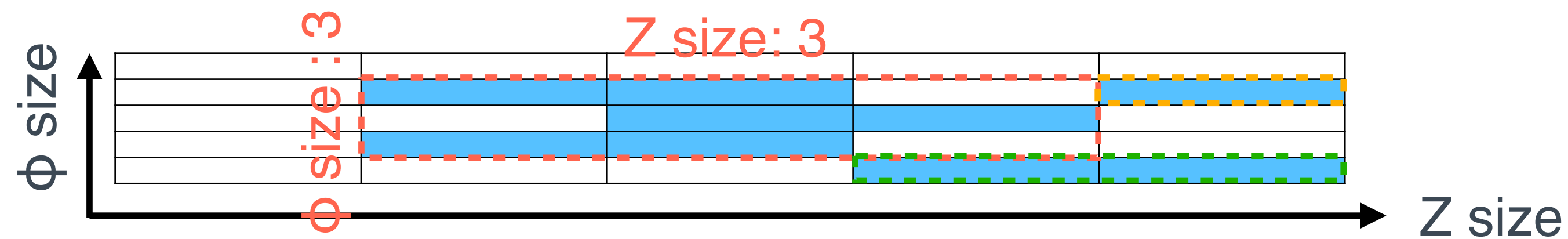In the cartoon, 3 clusters in total
Clu 1: Z size 3, φ size 3, Nhit 6
Clu 2: Z size 2, φ size 1, Nhit 2
Clu 3: Z size 1, φ size 1, Nhit 1

sPHENIX INTT **Beam Test 2021**

Run 52, Dec 10, 2021

Cluster size distribution - tight

- Directory: SDCC:/sphenix/user/ChengWei/INTT/ELPH_BeamTest2021
- The raw data post clustering : **cluster2D_information_offset-0.0000_adcinfo_NoCamac.root**
- The histograms of cluster-size distributions: **cluster2D_size.root**
- **2D clustering, Z size was not fixed at 1 (require exact adjacent hit in Z)**
- **Require the event with total NClus 3, and single cluster in each layer**
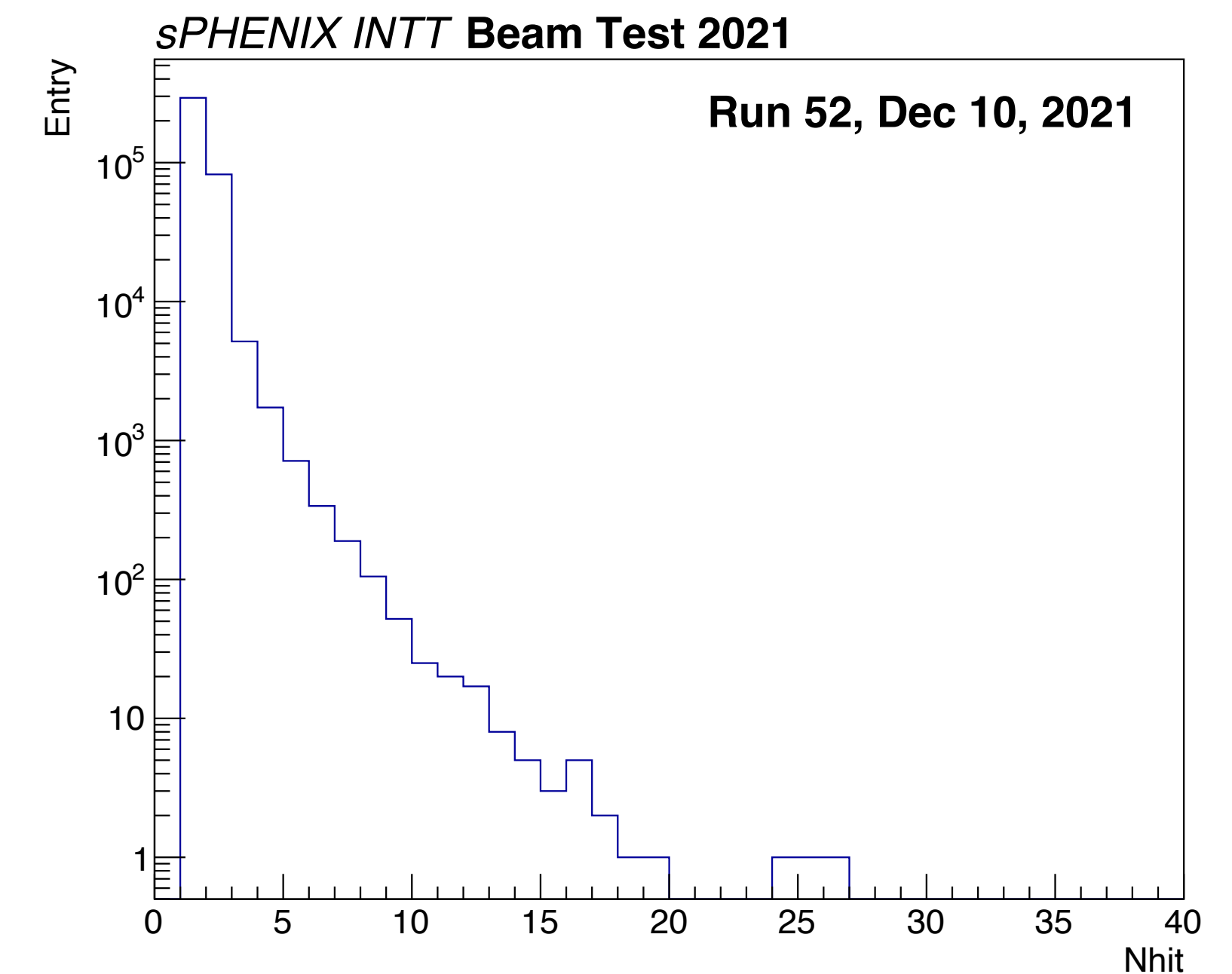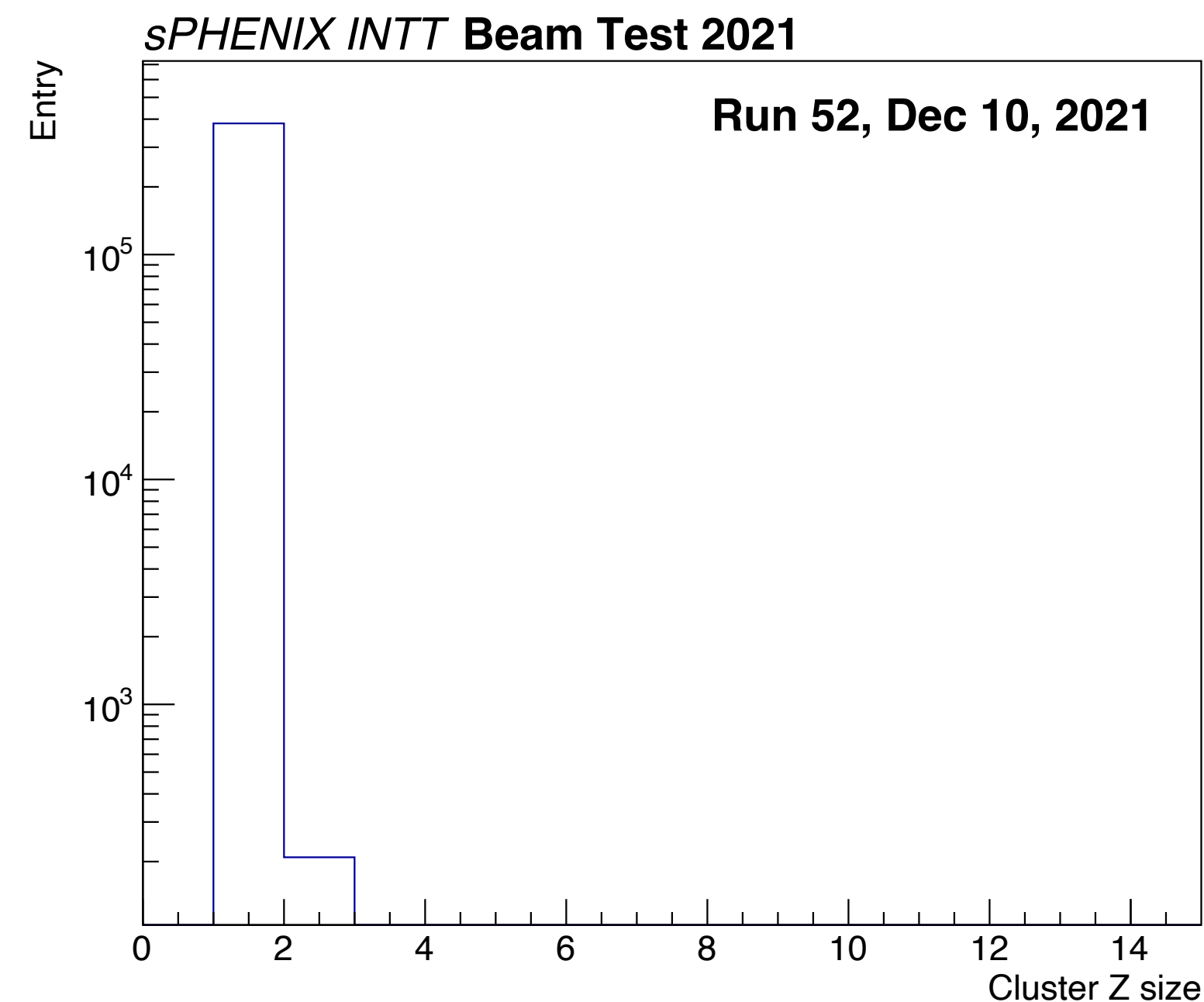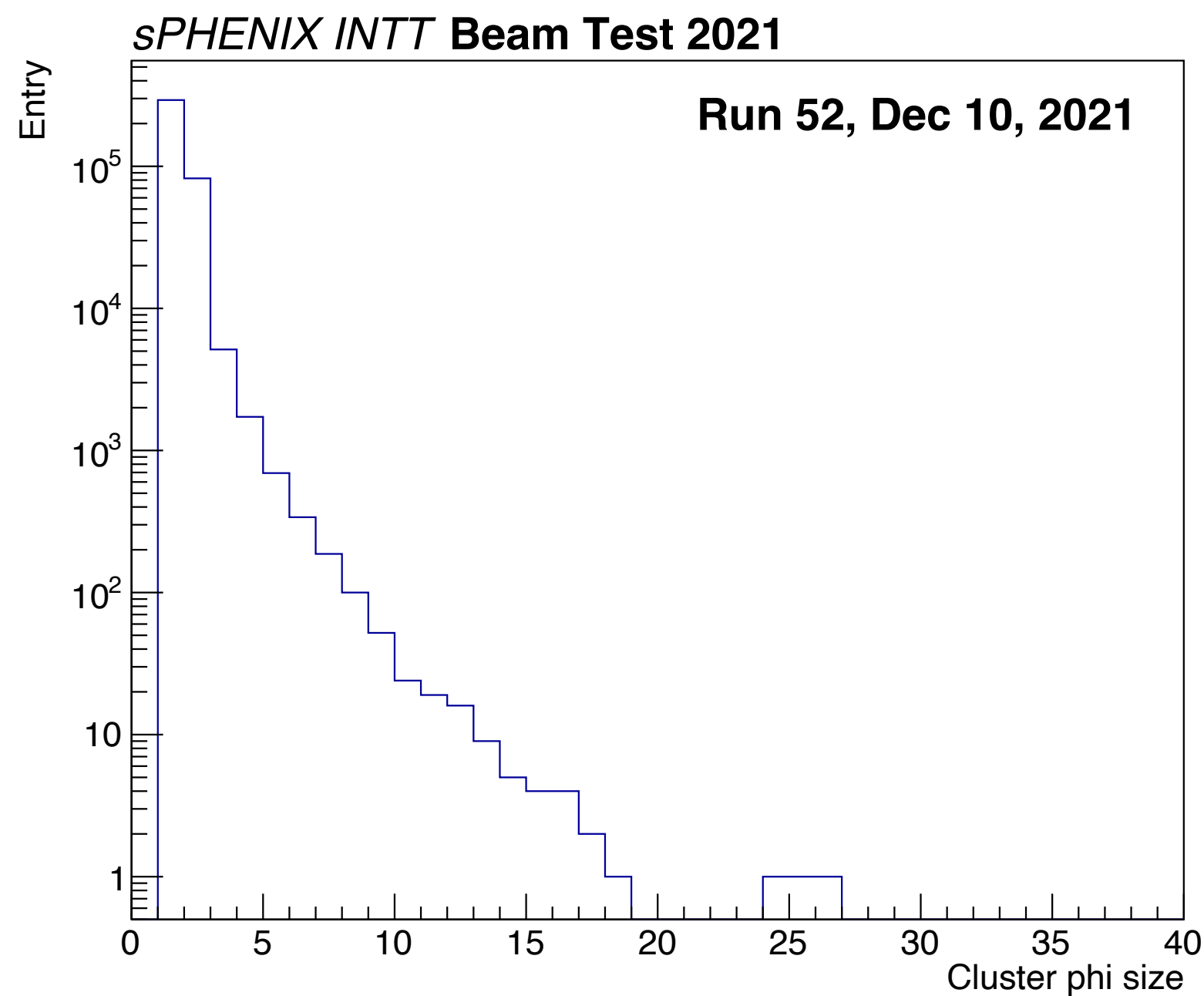
In the cartoon, 3 clusters in total
Clu 1: Z size 3, φ size 3, Nhit 6
Clu 2: Z size 2, φ size 1, Nhit 2
Clu 3: Z size 1, φ size 1, Nhit 1

Algorithm validation

detector-level raw data

module 1 → layer 0
module 6 → layer 1
module 5 → layer 2

post-clustering

Back up