sPEHNIX - INTT commissioning

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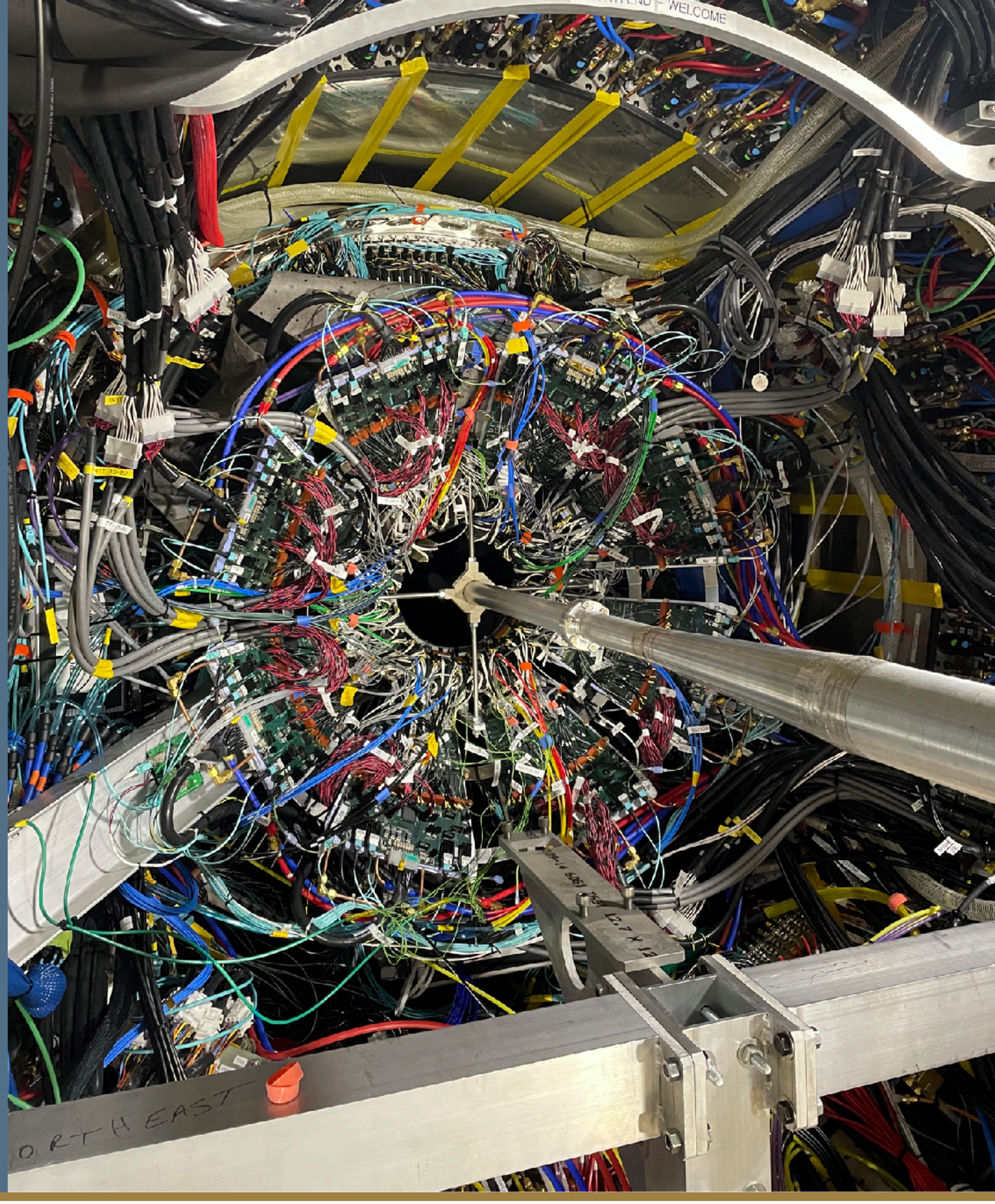
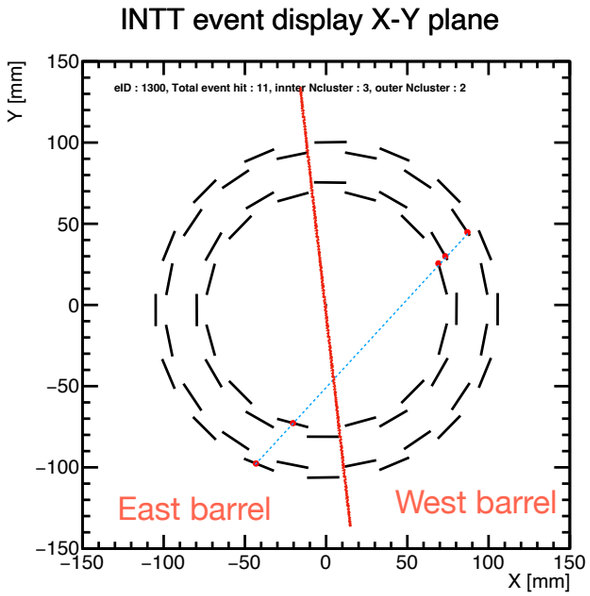
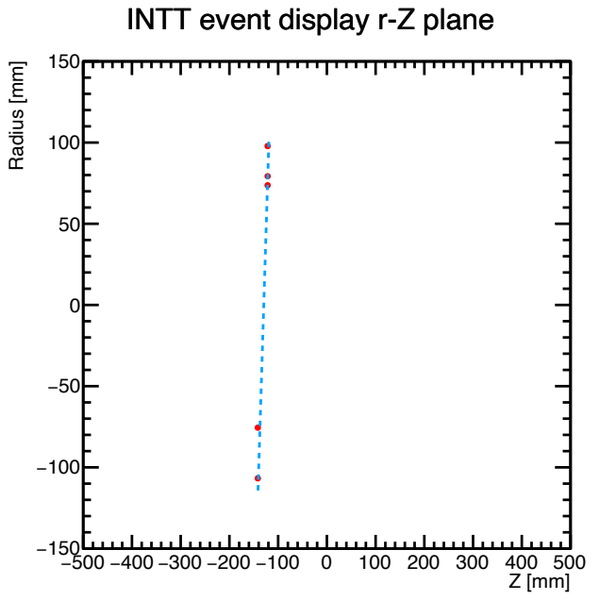


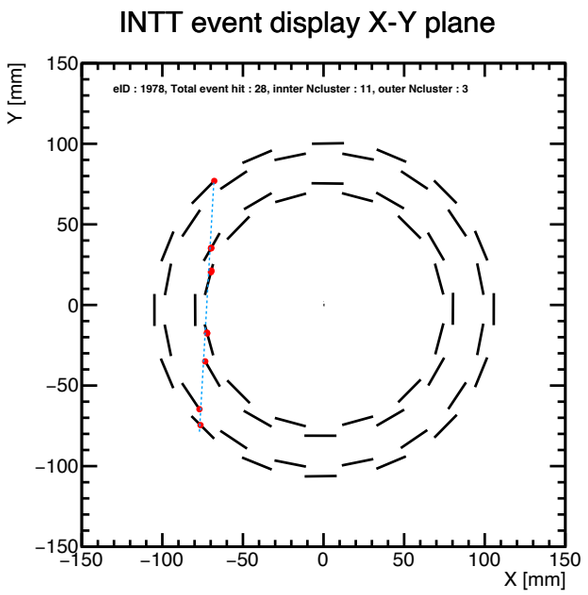
2023/08/10 INTT meeting

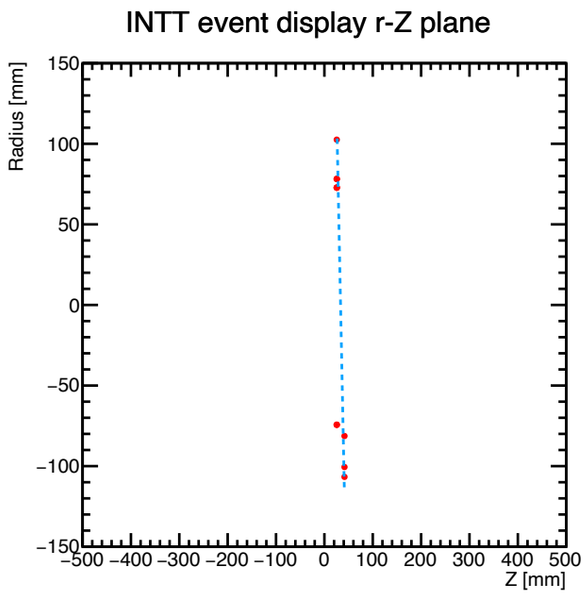
INTT cosmic event

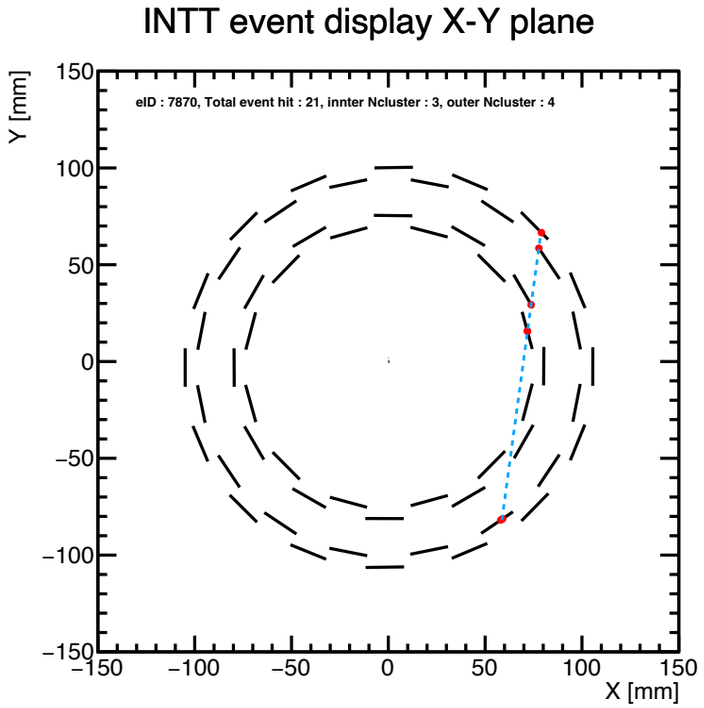
Run 25184, Field ON. n_collision : 8, Threshold : 25

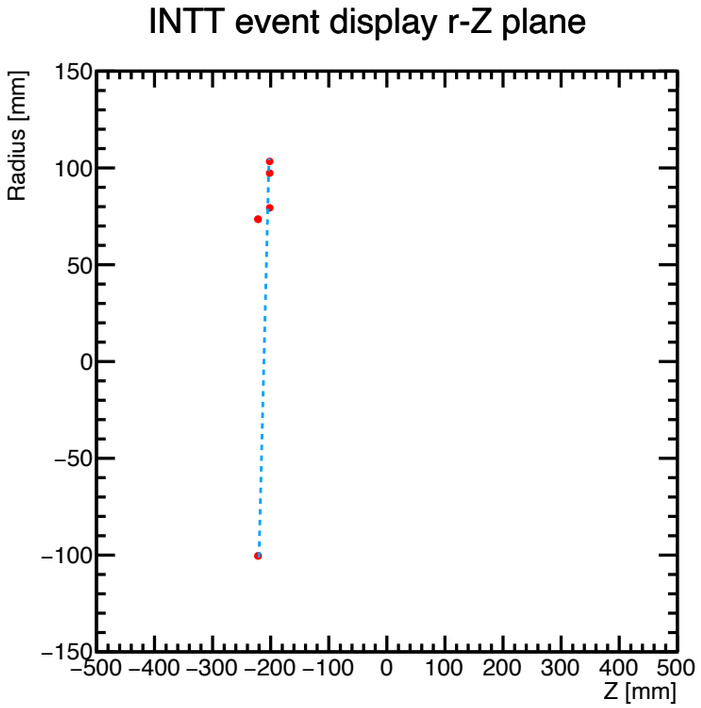








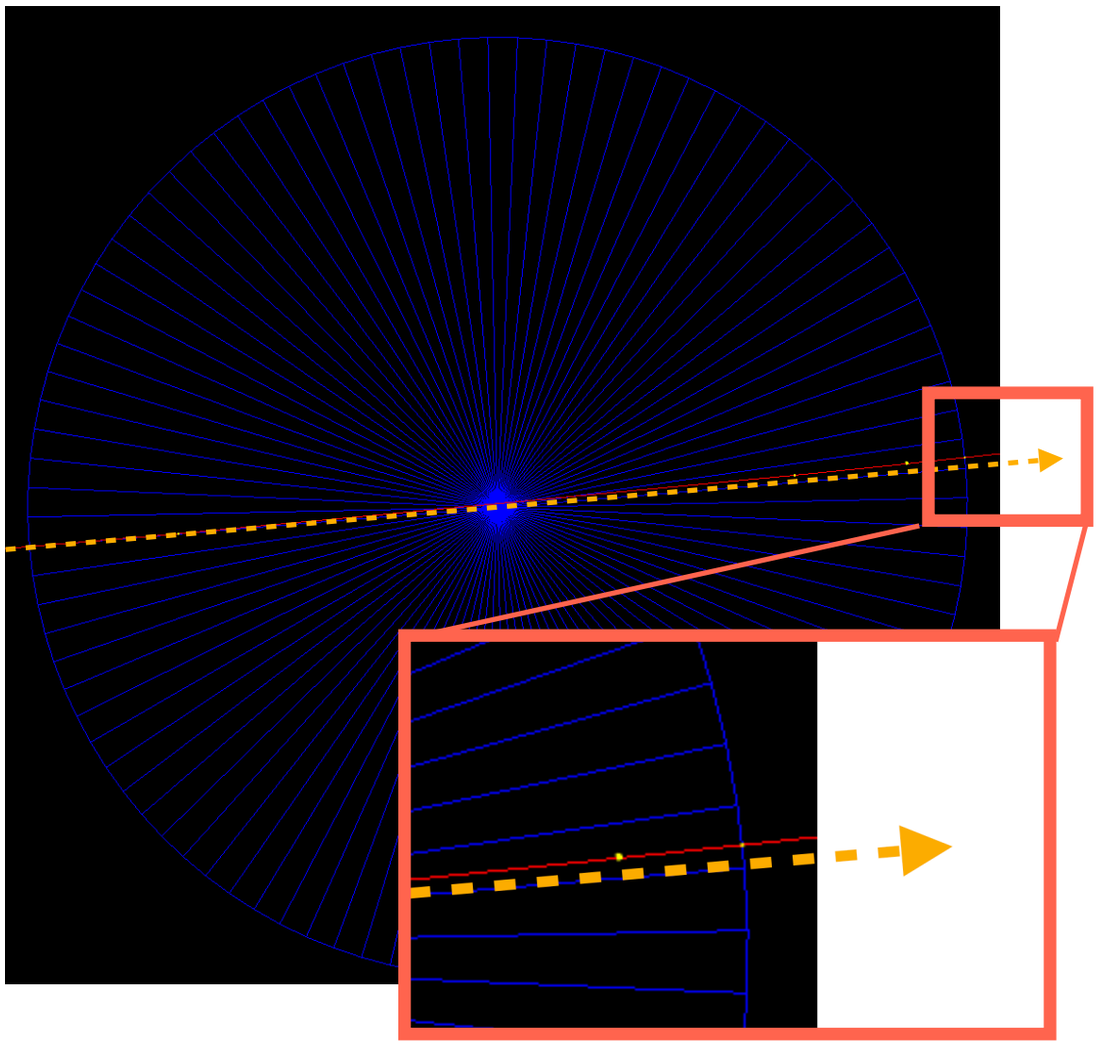




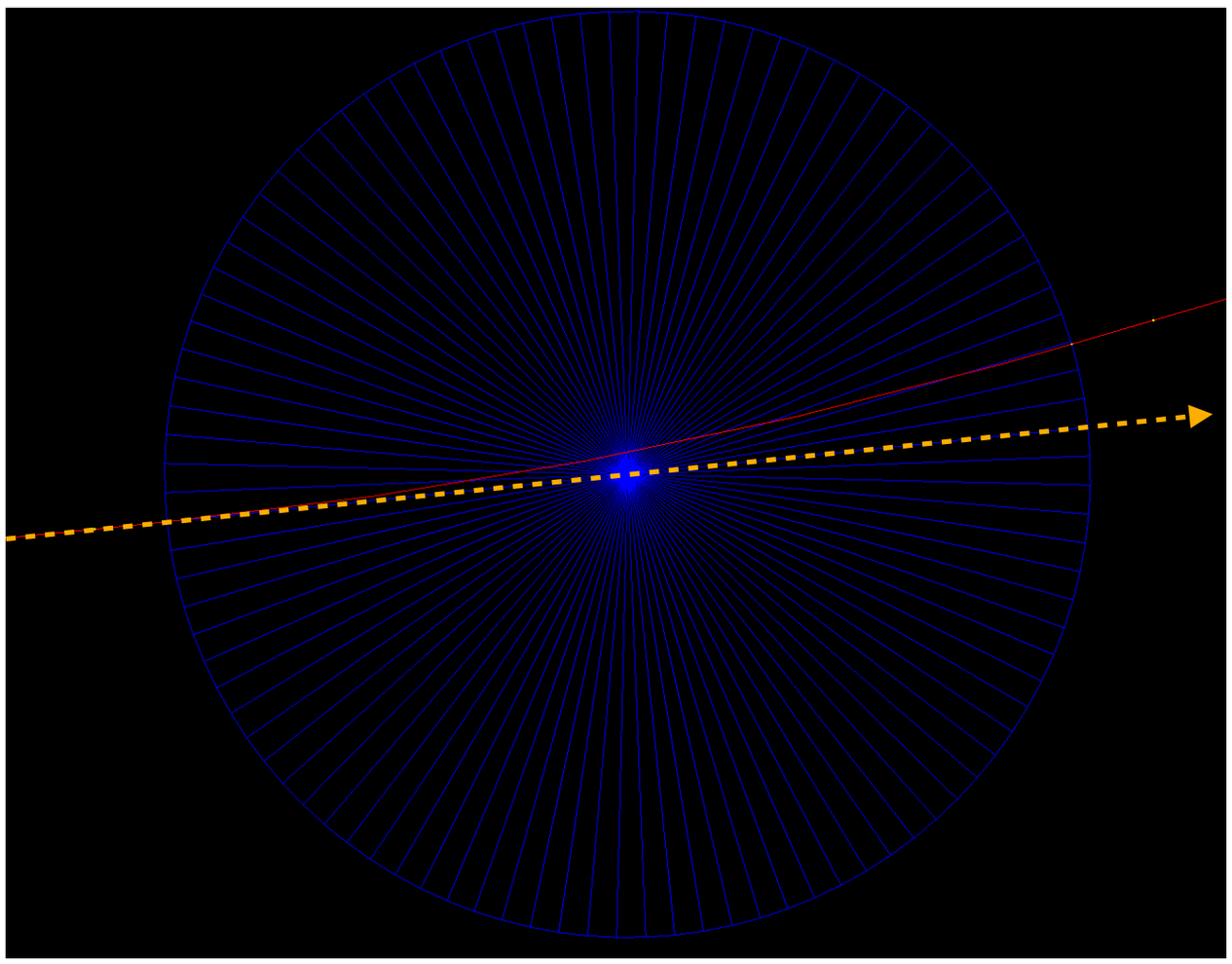
Track bending quick check

- G4 setup
  - Particle : mu-
  - Magnetic field : 1.5 T, in the blue circle
  - Blue circle radius : 10.2 cm (same as the outermost layer of INTT)

4 GeV



0.5 GeV

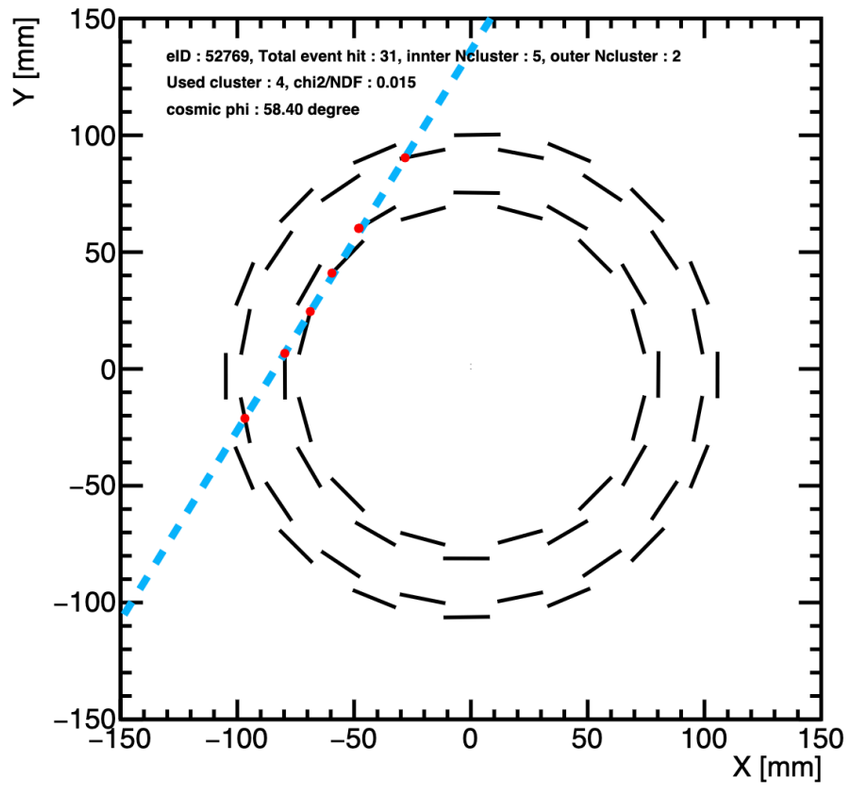


INTT cosmic fitting

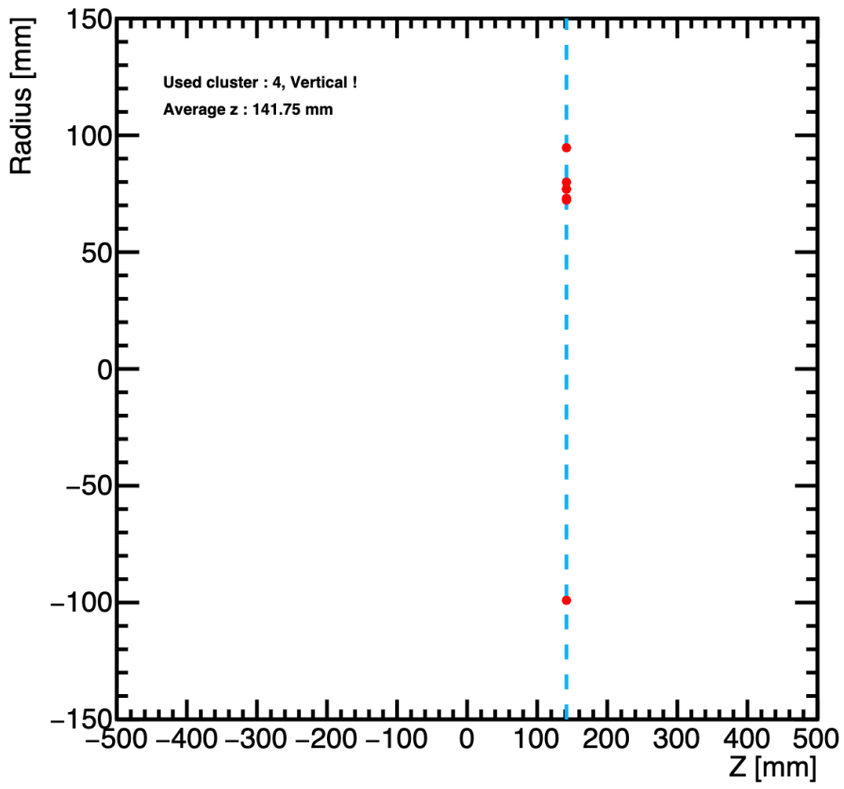
Run 25184, Field ON. n_collisions : 8, Threshold : 25

- Cosmic :
  - No origin (can be from any where)
  - Can be not just 4 points (up to 8 !)
- Strategy (N cluster in one event) :
  - Loop the $C^{N}_{4\sim7}$ combination.
  - Track determination (the one with smallest chi2/NDF)

INTT event display X-Y plane



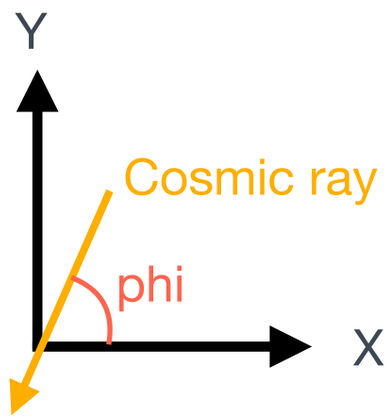
INTT event display r-Z plane



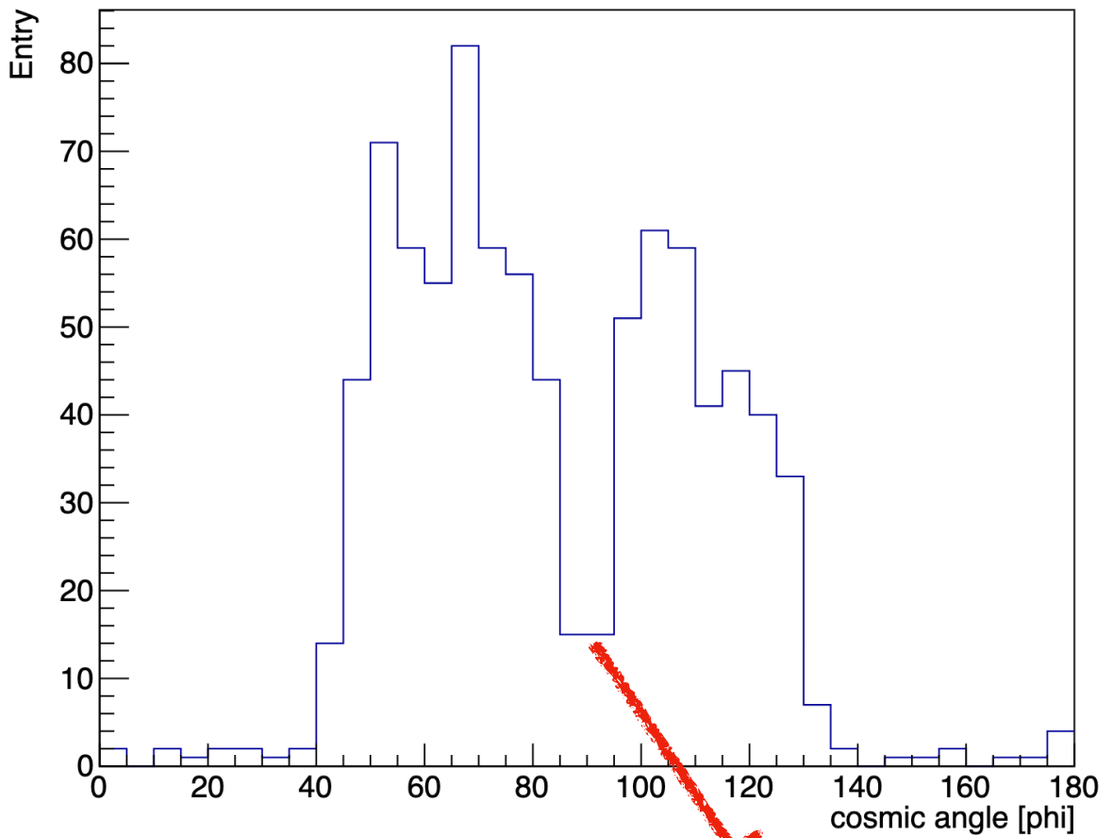
To do, add the error bar in the r-Z plane (± 8 or 10 mm)

INTT cosmic fitting

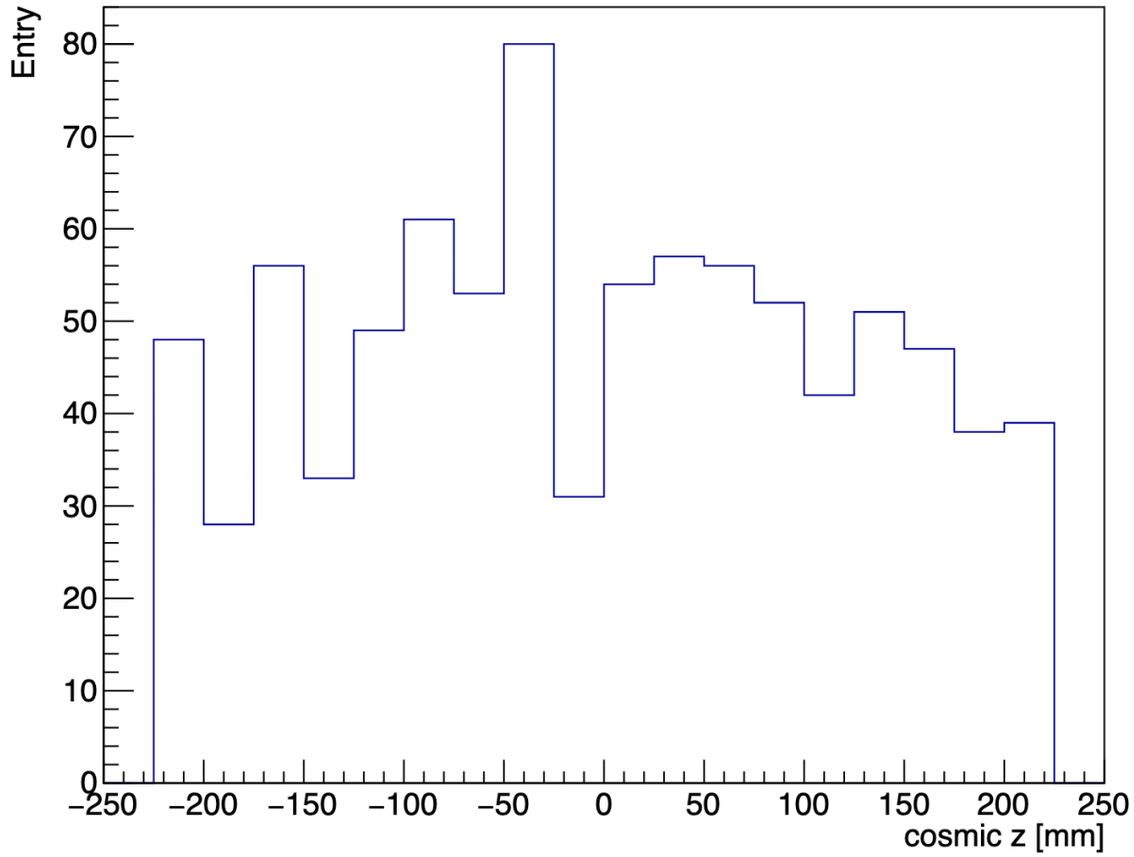
Run 25184, Field ON. n_collisions : 8, Threshold : 25



Phi angle



Track Z position



Because of the non-bias sensor ?

Backup

DAC Scan config

DAC Scan

Extend to max range

Scan	1	2	3	4	5	6	7	8	9	10	11	12
DAC0	8	28	48	68	88	108	128	148	168	188	212	236
1	12	32	52	72	92	112	132	152	172	192	216	240
2	16	36	56	76	96	116	136	156	176	196	220	244
3	20	40	60	80	100	120	140	160	180	200	224	248
4	24	44	64	84	104	124	144	164	184	204	228	252
5	28	48	68	88	108	128	148	168	188	208	232	255
6	32	52	72	92	112	132	152	172	192	212	236	255
7	36	56	76	96	116	136	156	176	196	216	240	255

- BigPartition together with MBD (Must) no need to be a dedicated run
- Can be done with n_collision=127 (w/o waiting for asynchronous timing issue btwn intt servers.
- 12 settings
- > 1M events at ~400Hz
- ~ 12 hours total
- If the series of data are interrupted by the beam dump, repeat the same setting as the last run at the last store.

3

The selections for the Z vertex

- fNhits cut
- cluster size > 4 continue
- sum_adc_conv < 31 continue
- hot region cut

- N cluster cut (inner + outer)

- inner_phi - outer_phi cut
- DCA distance cut

- N good track in one event cut
  - For Z vtx calculation

Z position correction

- The z pos of origin-closest column (column 13) :
  - 0.1 mm / 2 (gap b/w two HDIs) +
    0.5 mm (gap in HDI) +
    1 mm (gap in sensor) +
    16 / 2 mm (half width of typeA strip) = 9.55 mm, vice versa

- The z pos of column 5 (last typeB column) :
  - 121.55 mm (Z pos of column 6) +
    8 mm (half cell of type A sensor) +
    1 mm (gap between active area & sensor edge) +
    0.2 mm (gap between two sensors) +
    1 mm (gap between active area & sensor edge) +
    10 mm (half cell of type B sensor) = 141.75, vice versa