Update of CNAO2023_MC simulation campaign

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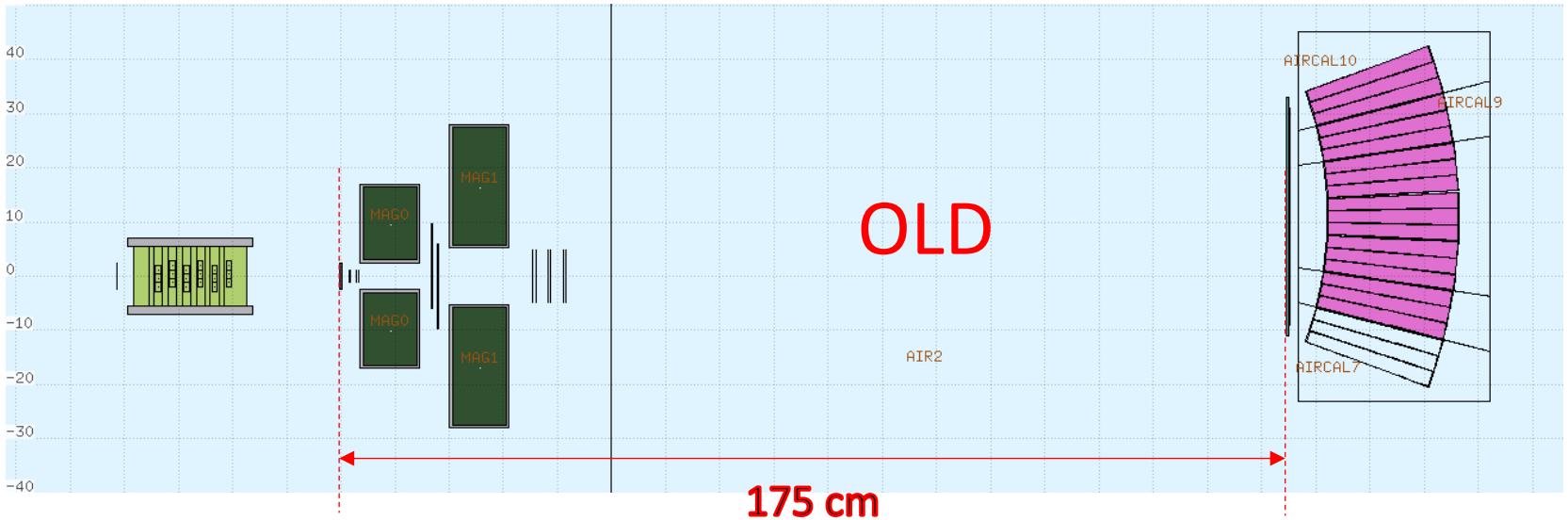
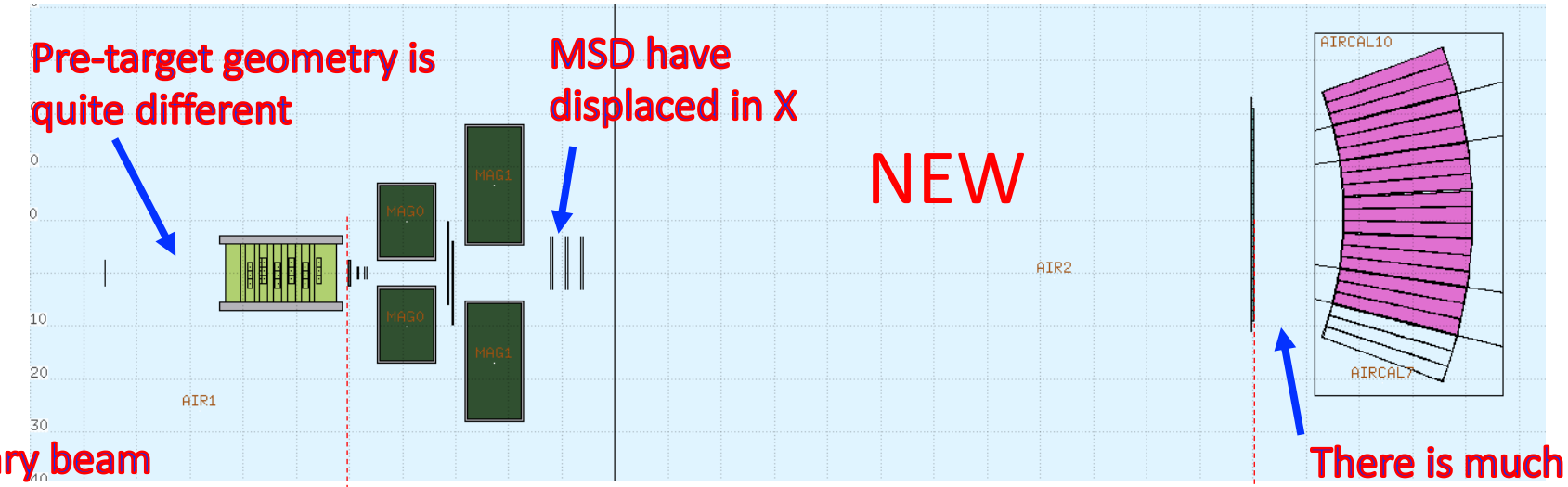
Introduction

The new campaign **CNAO2023_MC** has been updated to take into account the geometrical survey

We have still the calculated magnetic map. The results of LNF measurements have not yet been sent

New CNAO2023_MC design

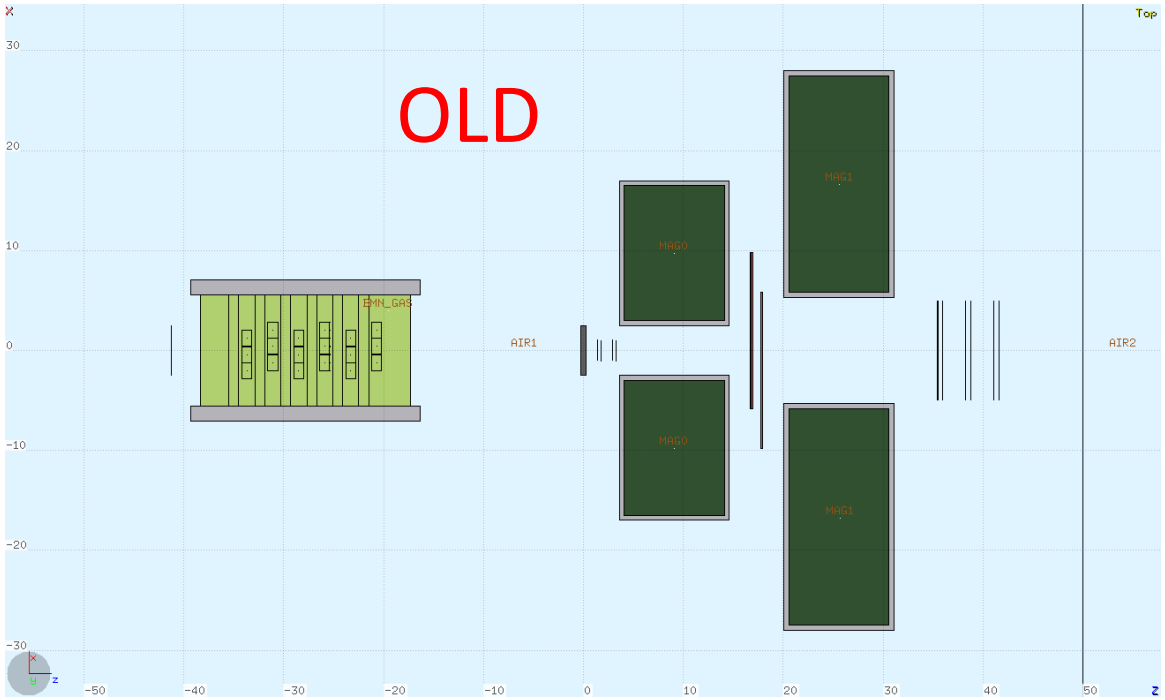


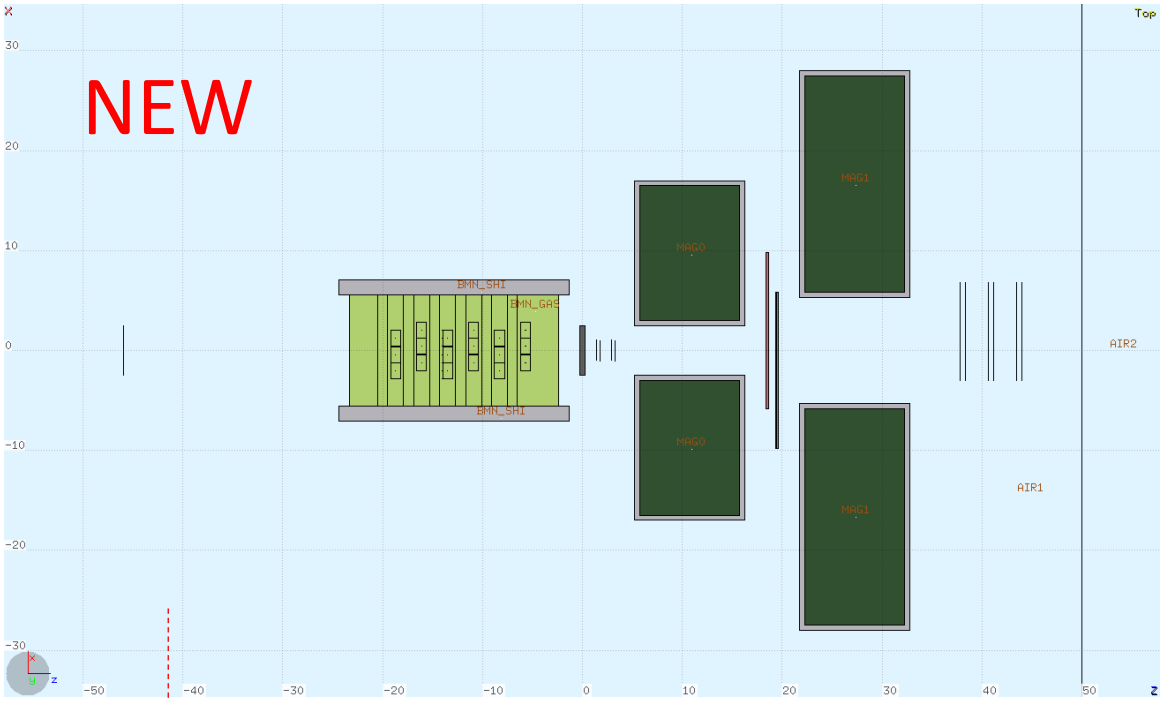


Primary beam starts at z=-63 cm (nozzle

There is much more space between TW and Calo with respect to CNAO2022

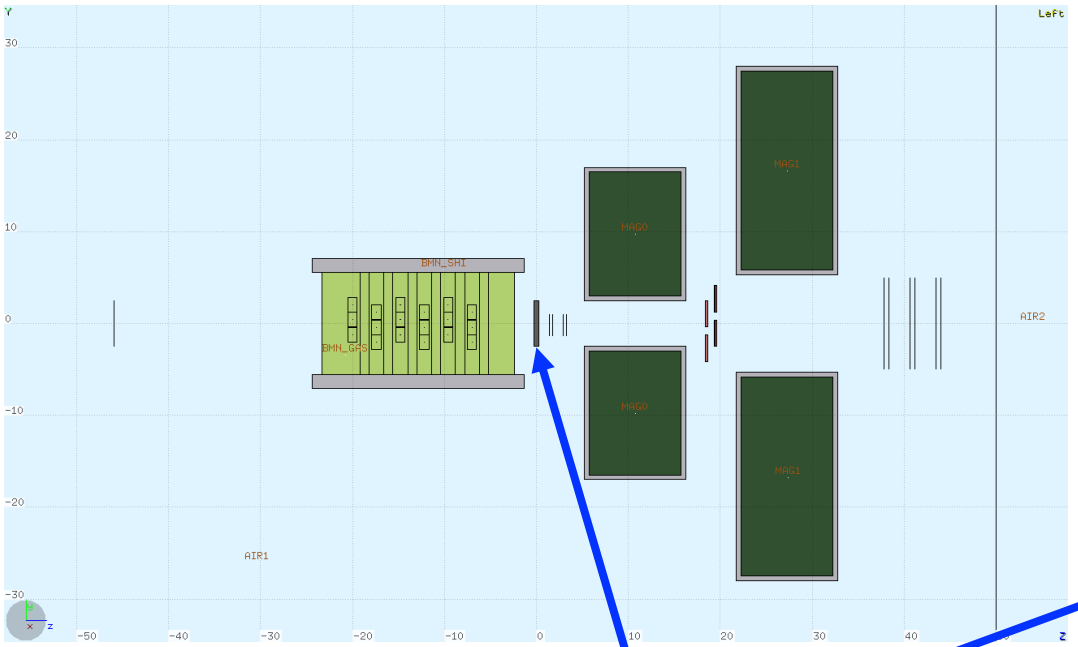
New CNAO2023_MC design: details of table elements



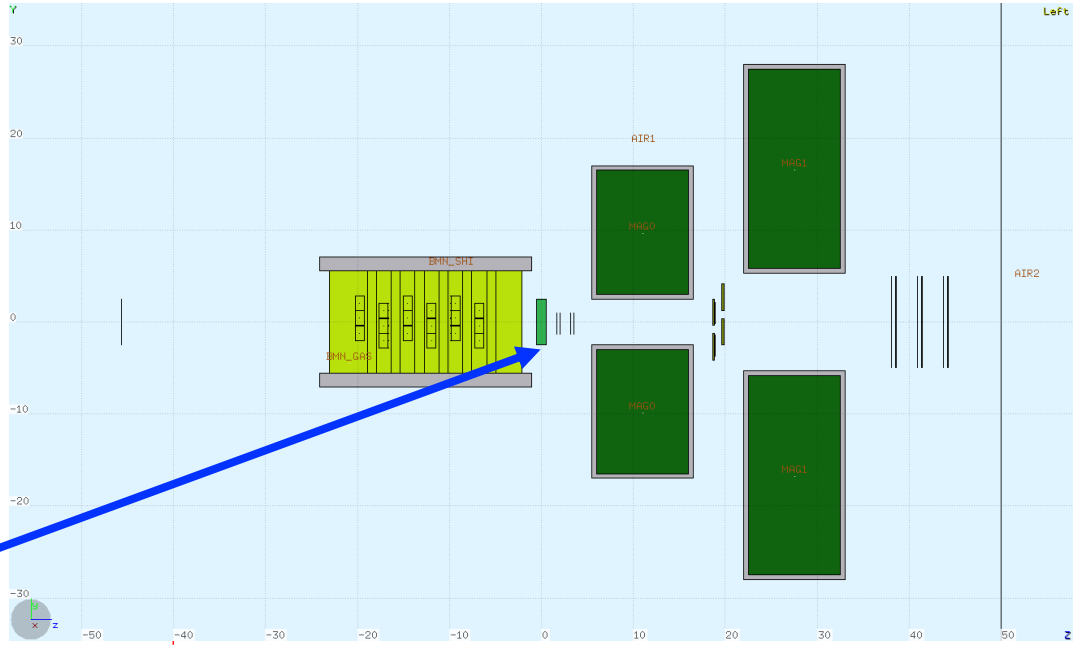


New CNAO2023_MC design: 2 runs in the campaign

Run 1: C target 5mm



Run 2: C_2H_4 target 10 mm



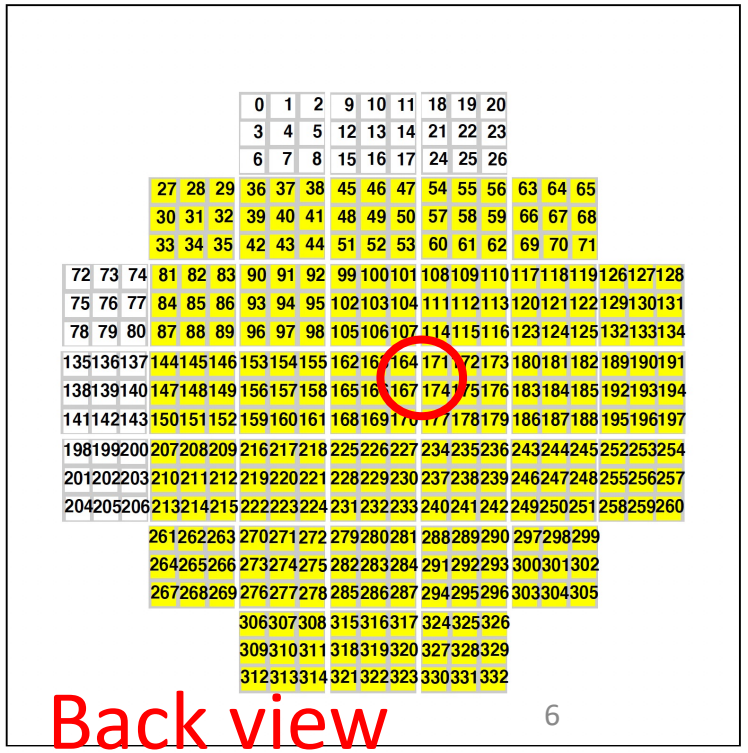
The z=0 position is always kept at the center of the target, therefore coordinates of center of pre- and post-target elements are moved by 0.25 cm in Run 2

There will be also a Run 3: Air target (same geometry as Run 1)

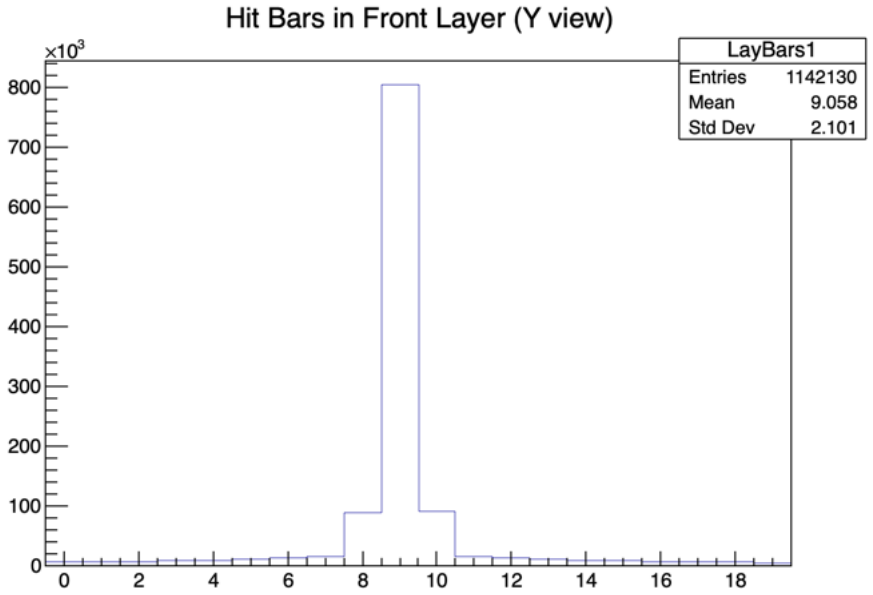
Some issues conflicting with geometrical survey

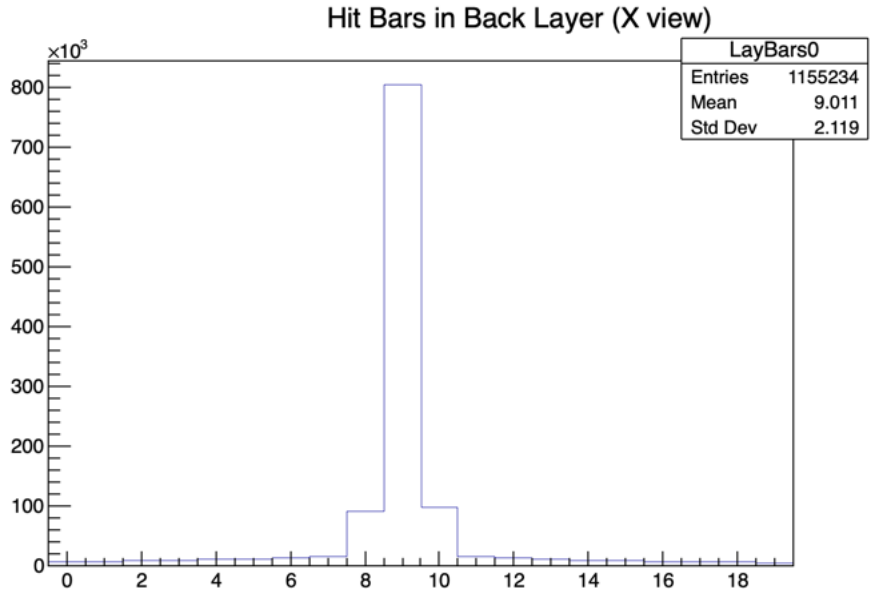
For the moment we have assumed a perfectly centered beam, perfectly aligned with z axis.

- We have moved TW to have primary beam centered on bar 9 of TW
- We have moved CALO so to have crystals no. 164,167,171,174 (as from Francesca's instructions) as the most frequently hit



TW

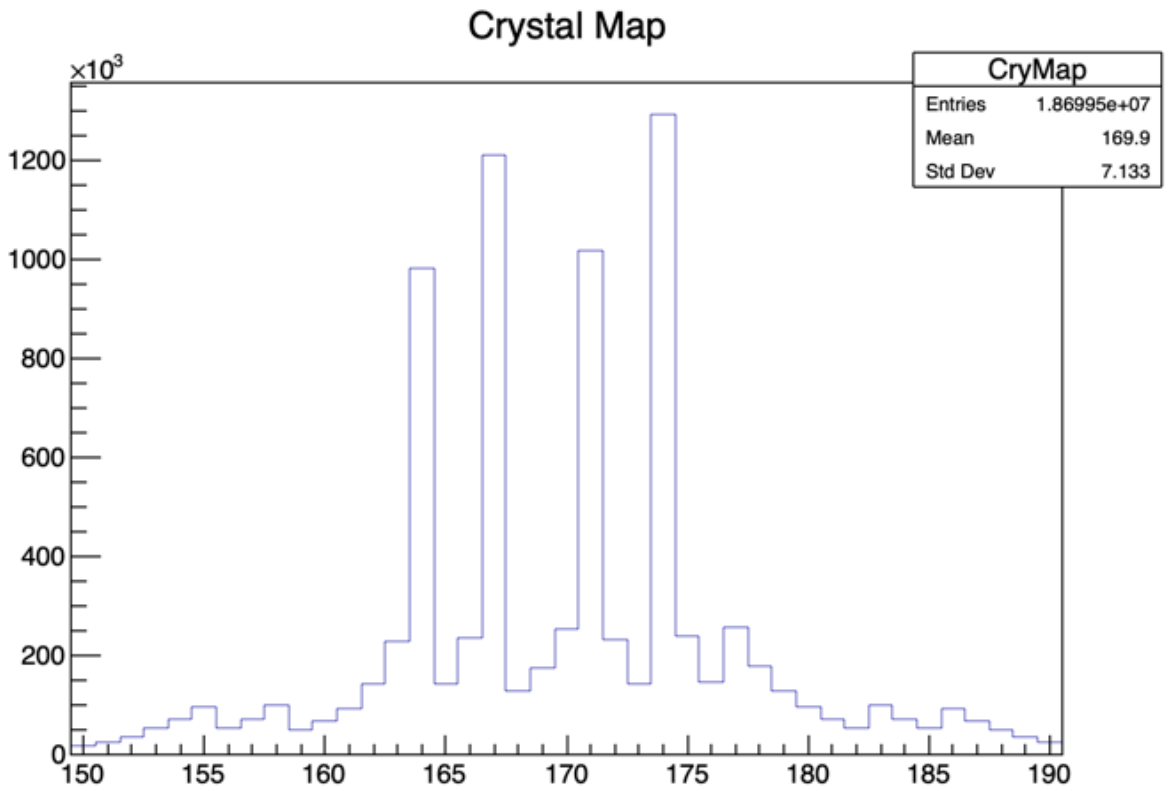




This is achieved by a shift in X of 10.5 cm (survey: 11.5) and in Y of -1 cm

Question: could the beam be tilted at the origin? A fraction of 1 degree would be enough to get this difference

CALO

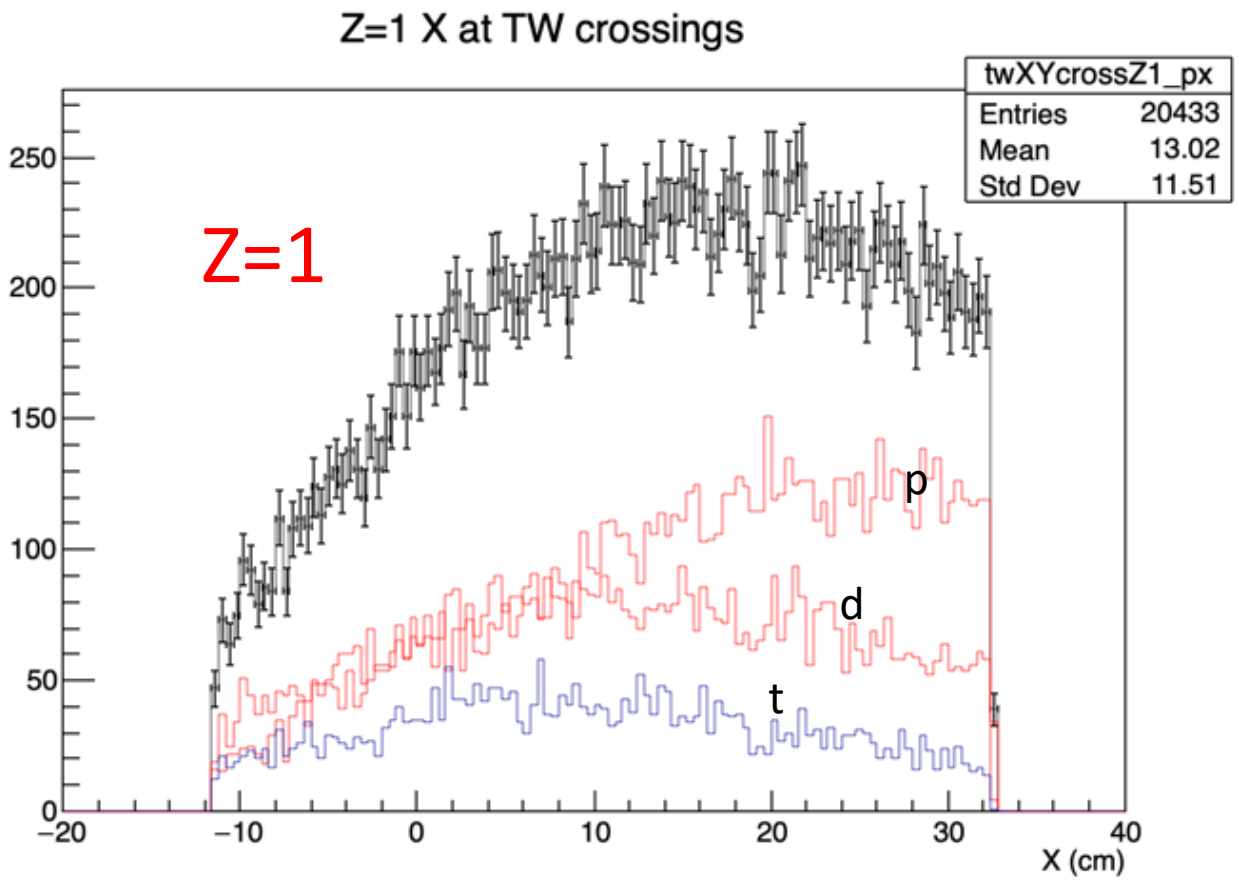


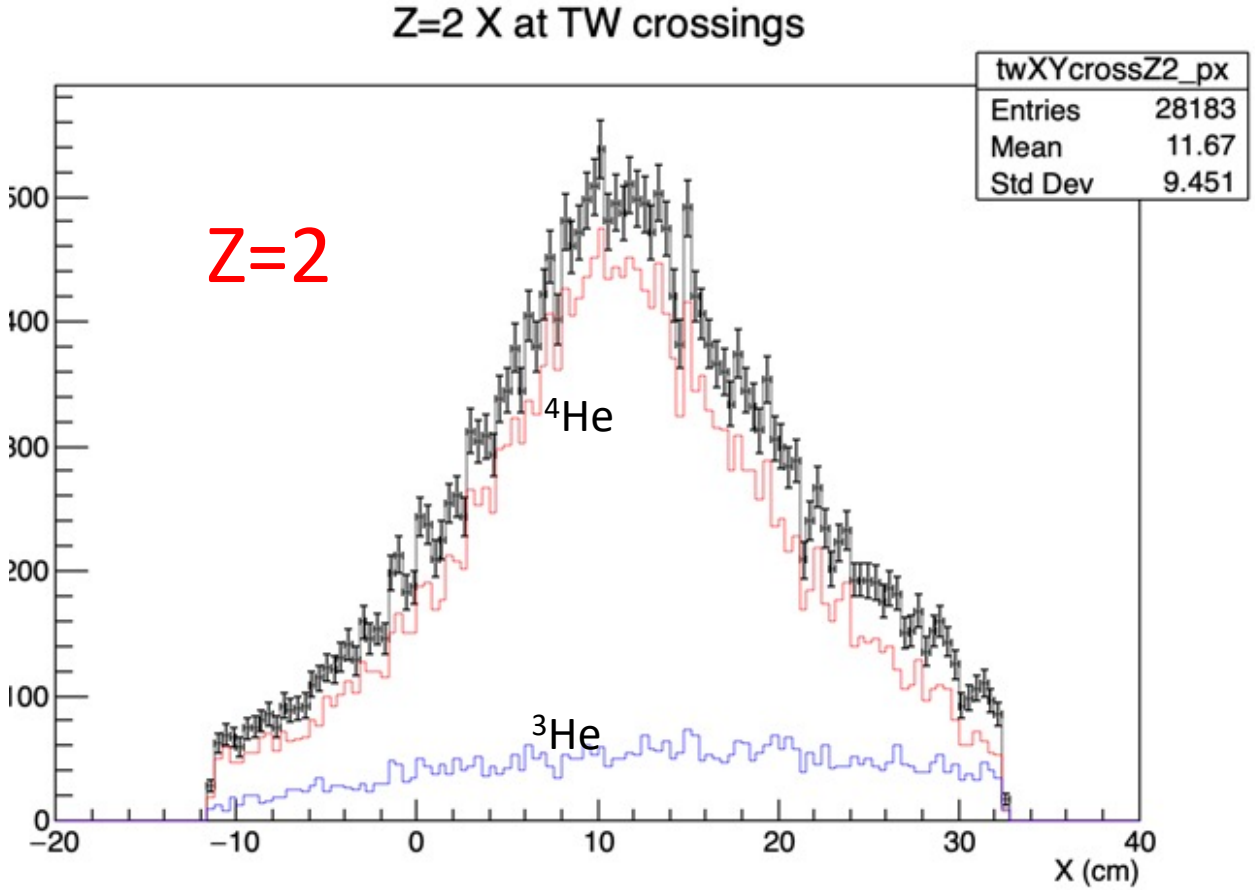
This is achieved by a shift in X of 9.5 cm (survey: 11) and in Y of -1 cm

However in simulation crystal positions are very regularly spaced, not really matching the real situation

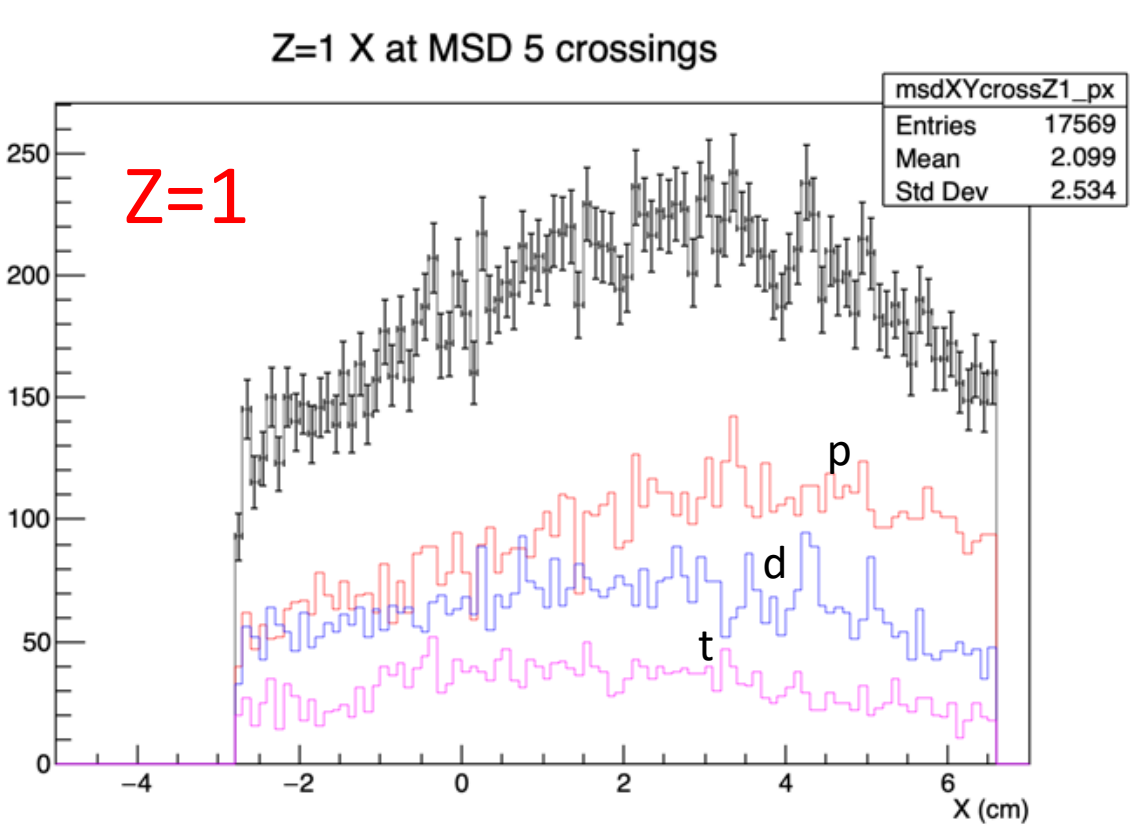
Again: a tiny beam tilt could explain this difference

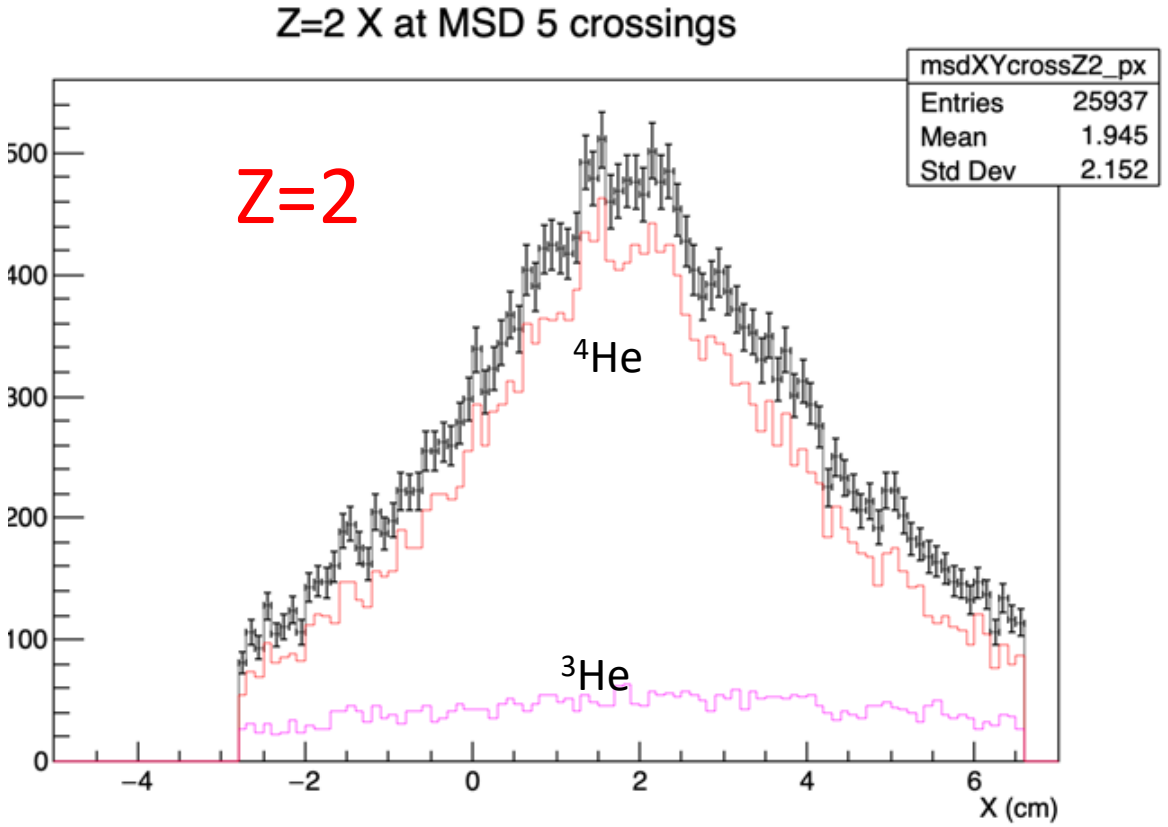
Lateral distribution on TW





Lateral distribution on MSD



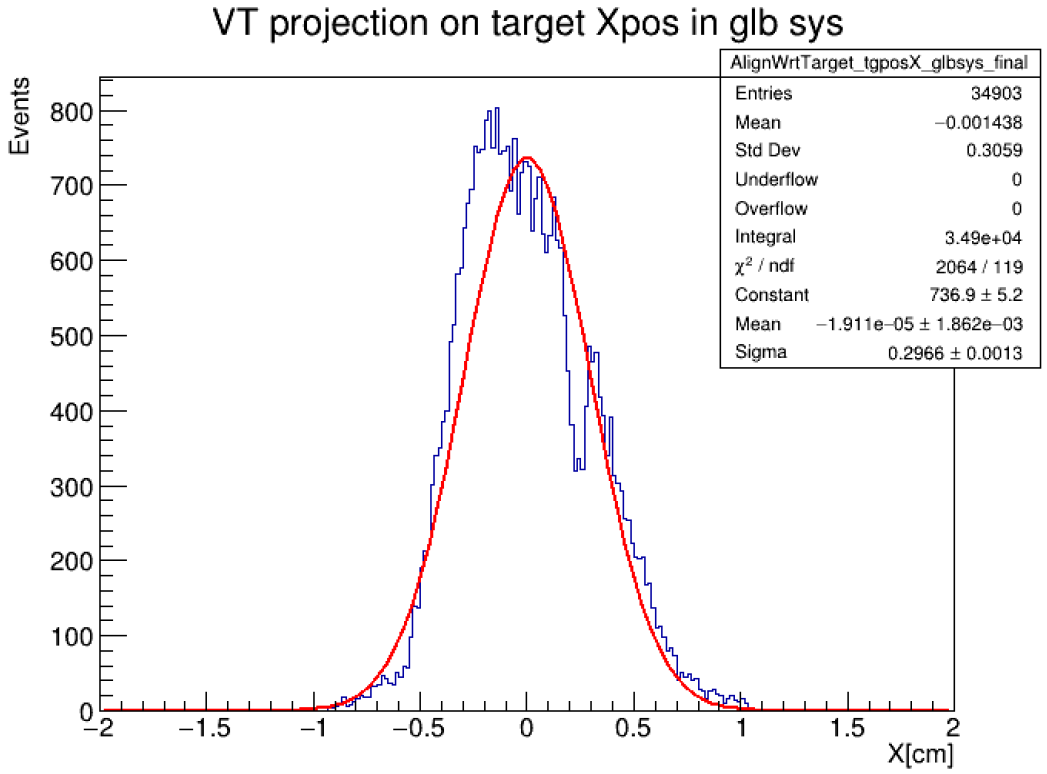


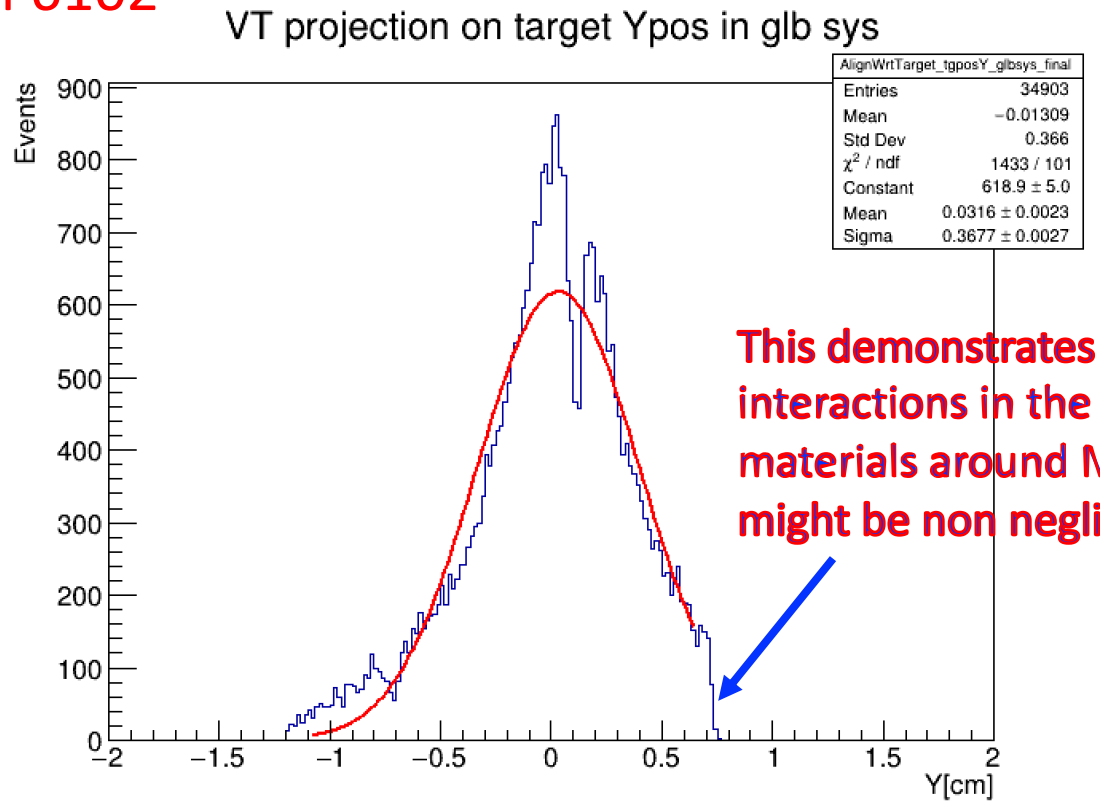
The shift applied to MSD seems to be satisfactory

Open issues - 1

1. Beam shape and position (and possible tilt)

VTX: Run 6102





This demonstrates that interactions in the passive materials around M28 chips might be non negligible

Asymmetrical, not centered

Not yet implemented in simulation

Open issues -2

2. Passive materials in VTX

3. Passive materials in MSD

4. Exact geometry of IT has to be verified

5. True Magnetic Map