



Update of CNAO2023_MC simulation campaign

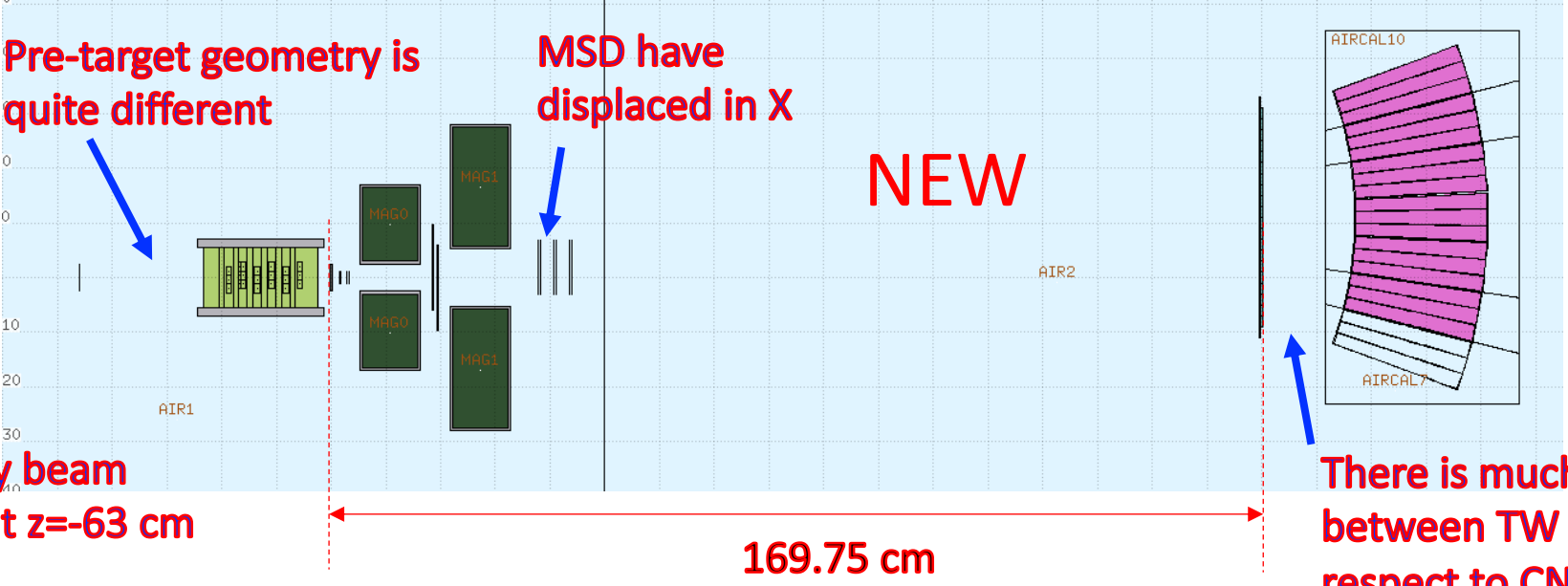
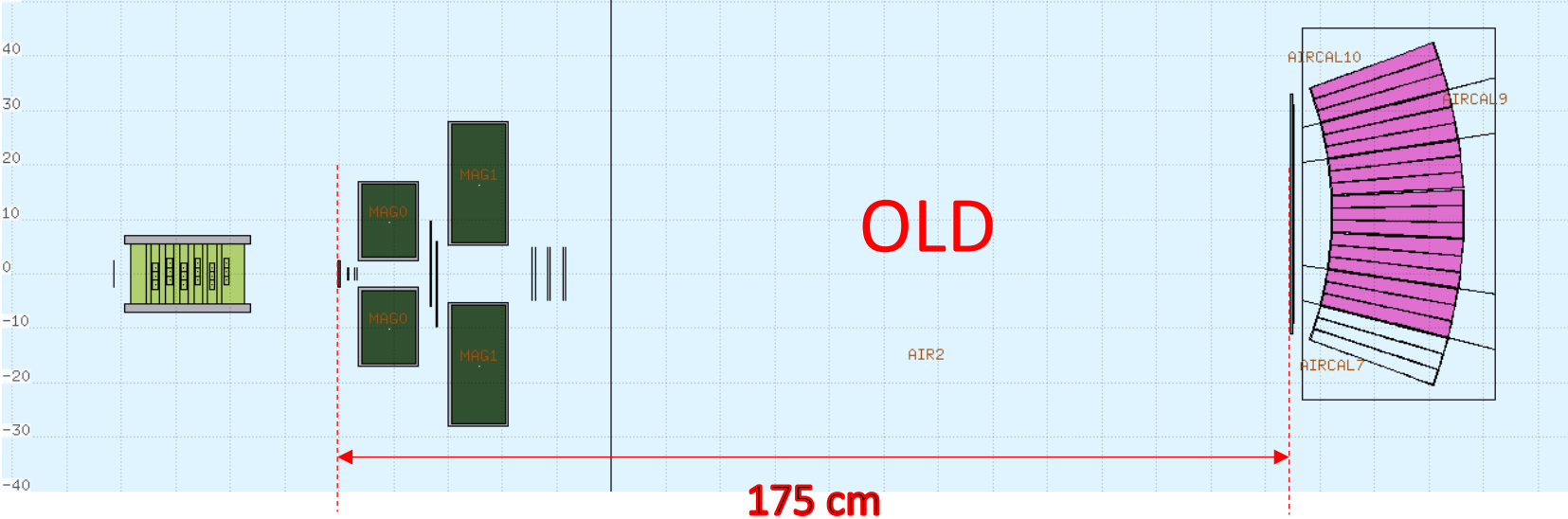
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Introduction

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



Pre-target geometry is quite different

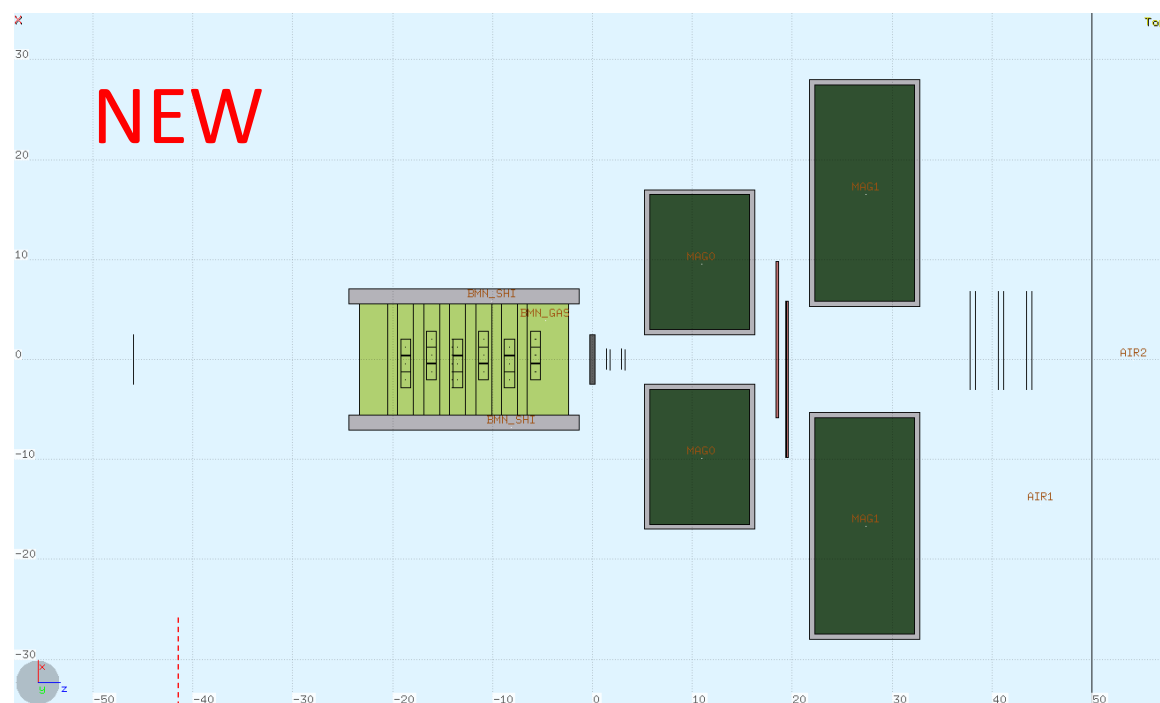
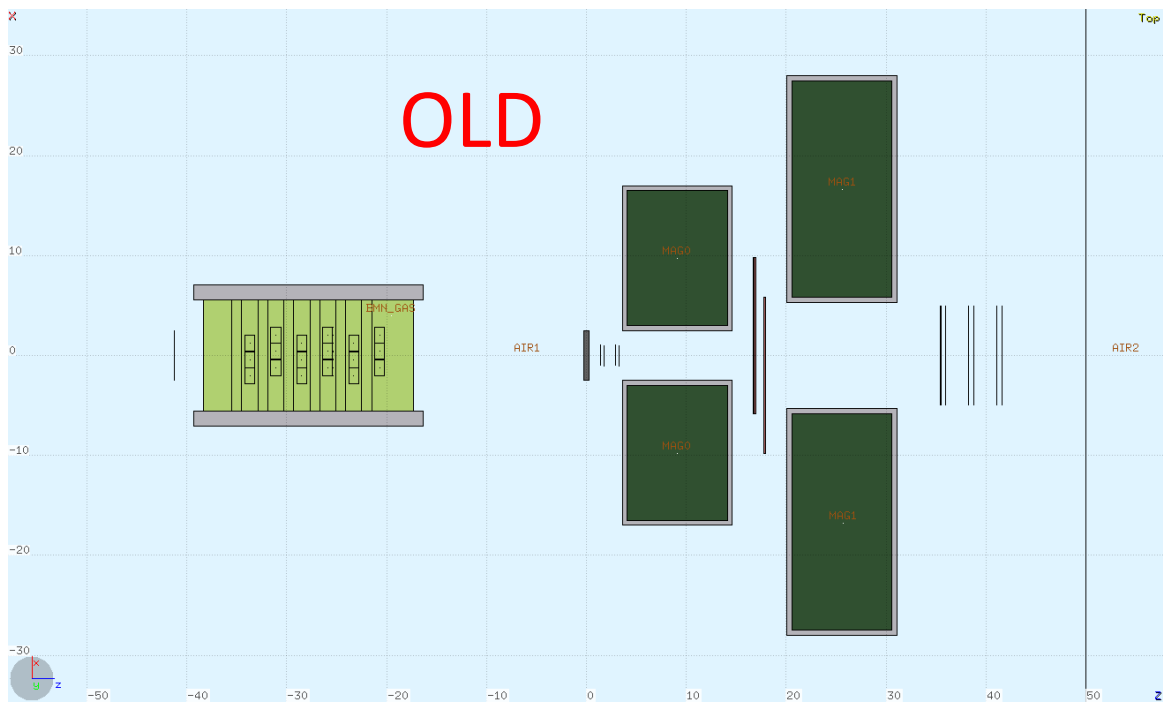
MSD have displaced in X

NEW

Primary beam starts at z=-63 cm (nozzle)

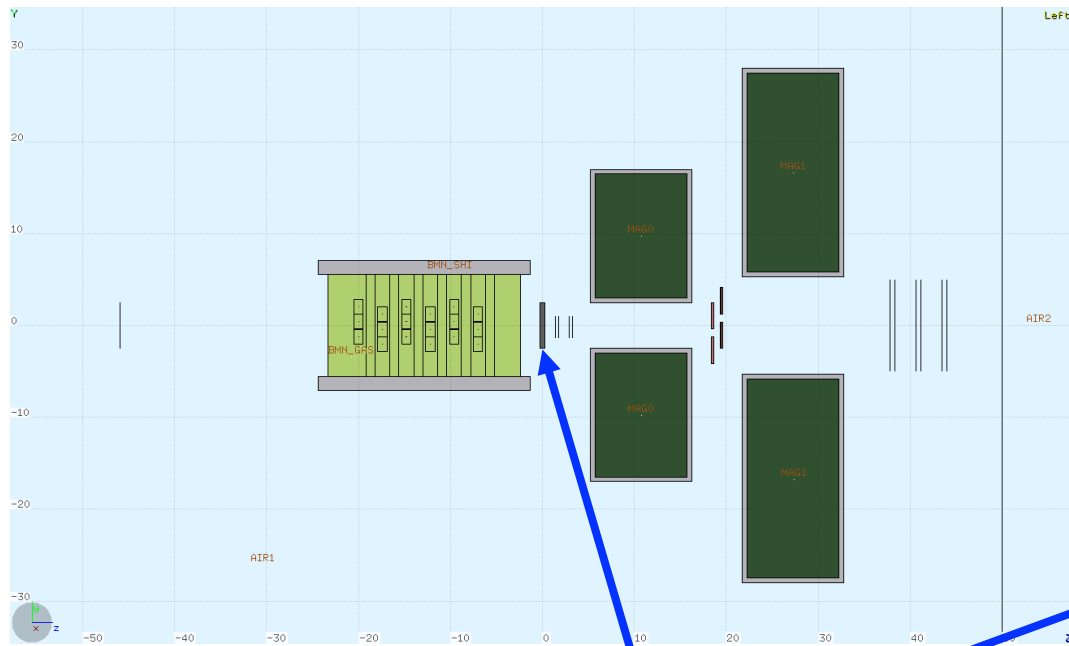
There is much more space between TW and Calo with respect to CNAO2022

New CNAO2023_MC design: details of table elements

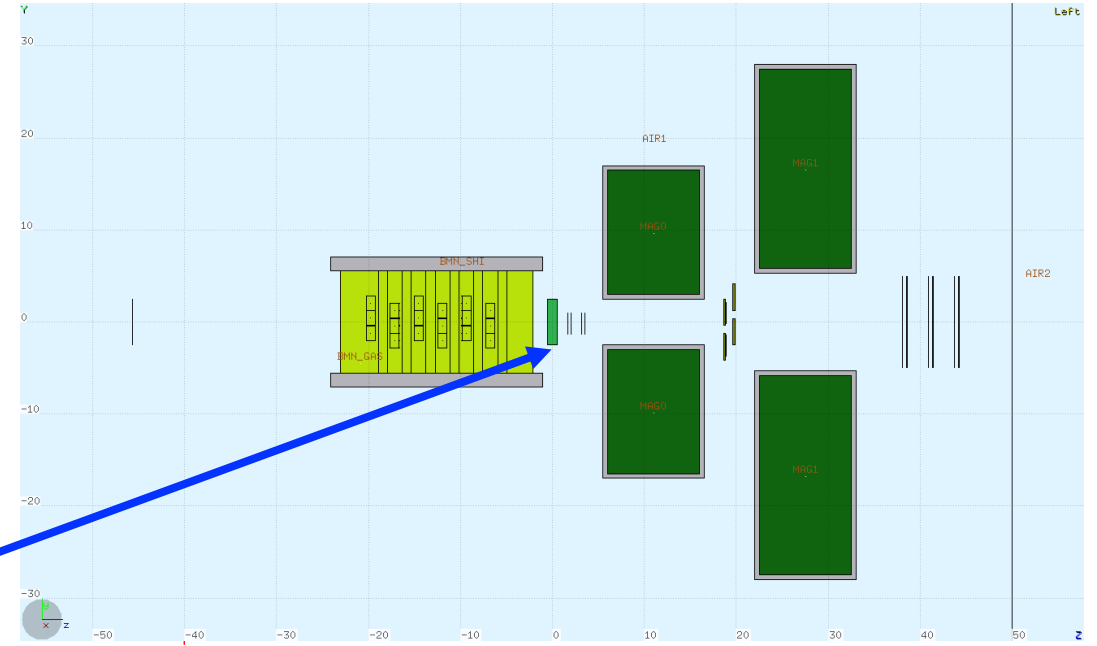


New CNAO2023_MC design: 2 runs in the campaign

Run 1: C target 5mm



Run 2: C₂H₄ 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.

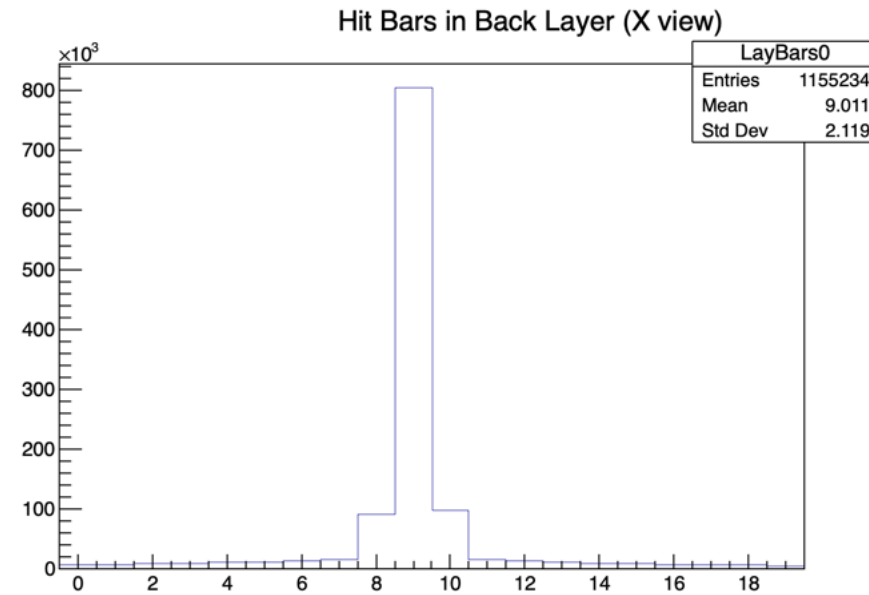
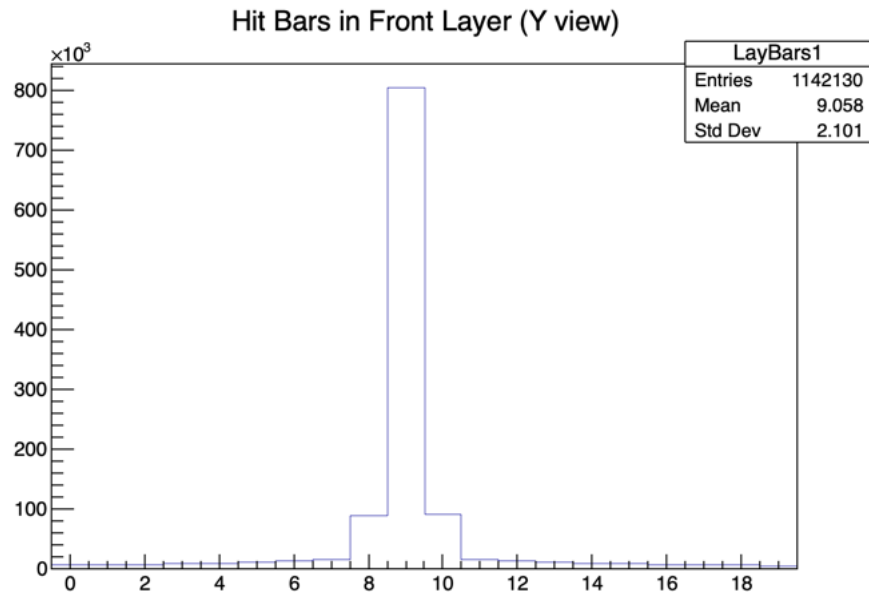
- We have moved TW to have primary beam centered on bar 9 of TW
- We have moved CALO so to have crystals no. 164,167,171,174 (as from Francesca's instructions) as the most frequently hit

Crystal ID to be mapped with Board/channel (Back view, side readout boards)

	0	1	2	9	10	11	18	19	20											
	3	4	5	12	13	14	21	22	23											
	6	7	8	15	16	17	24	25	26											
	27	28	29	36	37	38	45	46	47	54	55	56	63	64	65					
	30	31	32	39	40	41	48	49	50	57	58	59	66	67	68					
	33	34	35	42	43	44	51	52	53	60	61	62	69	70	71					
72	73	74	81	82	83	90	91	92	99	100	101	108	109	110	117	118	119	126	127	128
75	76	77	84	85	86	93	94	95	102	103	104	111	112	113	120	121	122	129	130	131
78	79	80	87	88	89	96	97	98	105	106	107	114	115	116	123	124	125	132	133	134
135	136	137	144	145	146	153	154	155	162	163	164	171	172	173	180	181	182	189	190	191
138	139	140	147	148	149	156	157	158	165	166	167	174	175	176	183	184	185	192	193	194
141	142	143	150	151	152	159	160	161	168	169	170	177	178	179	186	187	188	195	196	197
198	199	200	207	208	209	216	217	218	225	226	227	234	235	236	243	244	245	252	253	254
201	202	203	210	211	212	219	220	221	228	229	230	237	238	239	246	247	248	255	256	257
204	205	206	213	214	215	222	223	224	231	232	233	240	241	242	249	250	251	258	259	260
	261	262	263	270	271	272	279	280	281	288	289	290	297	298	299					
	264	265	266	273	274	275	282	283	284	291	292	293	300	301	302					
	267	268	269	276	277	278	285	286	287	294	295	296	303	304	305					
	306	307	308	315	316	317	324	325	326											
	309	310	311	318	319	320	327	328	329											
	312	313	314	321	322	323	330	331	332											

Back view

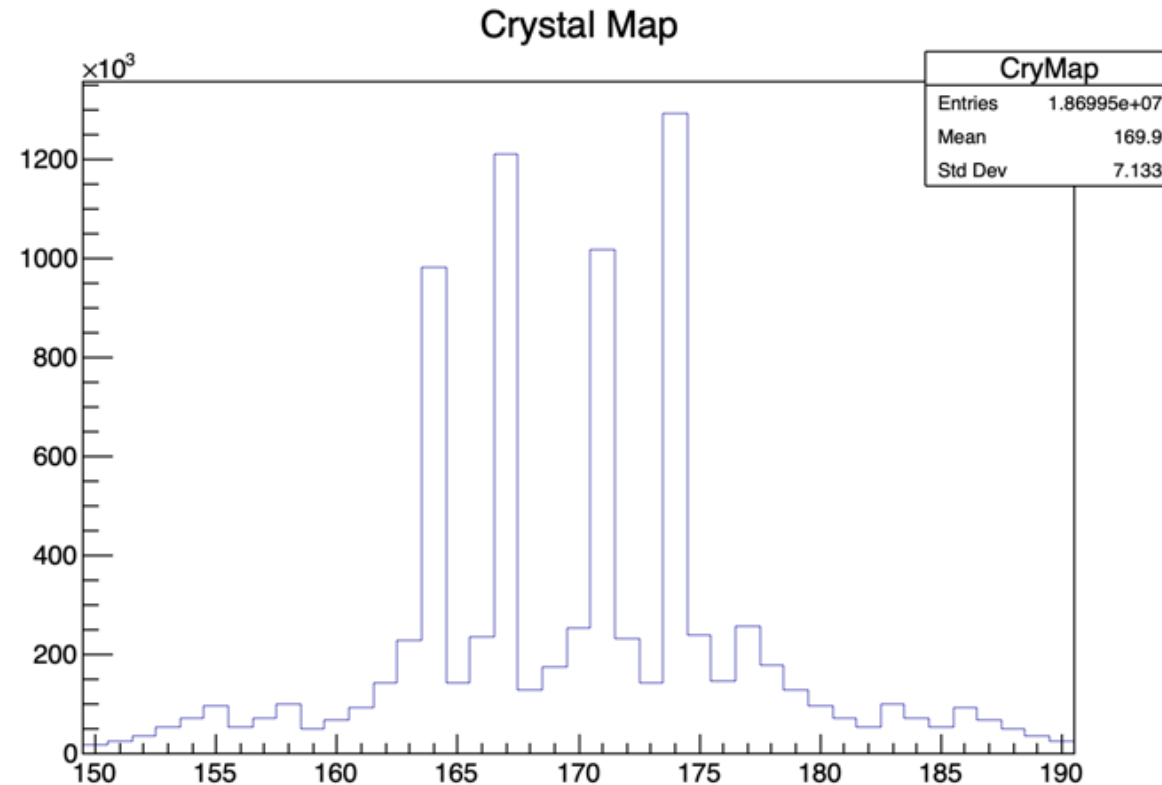
TW



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



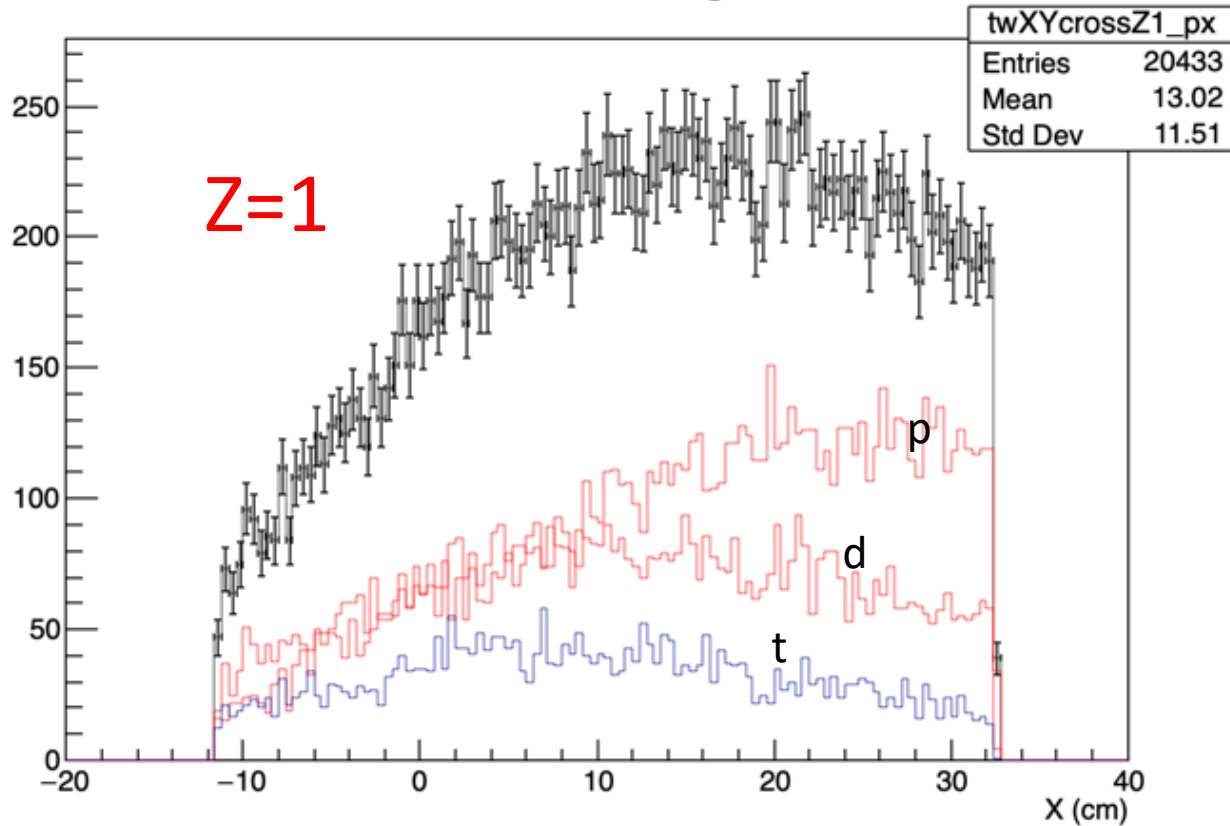
This is achieved by a shift in X of 9.5 cm (survey: 11) and in Y of -1 cm

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

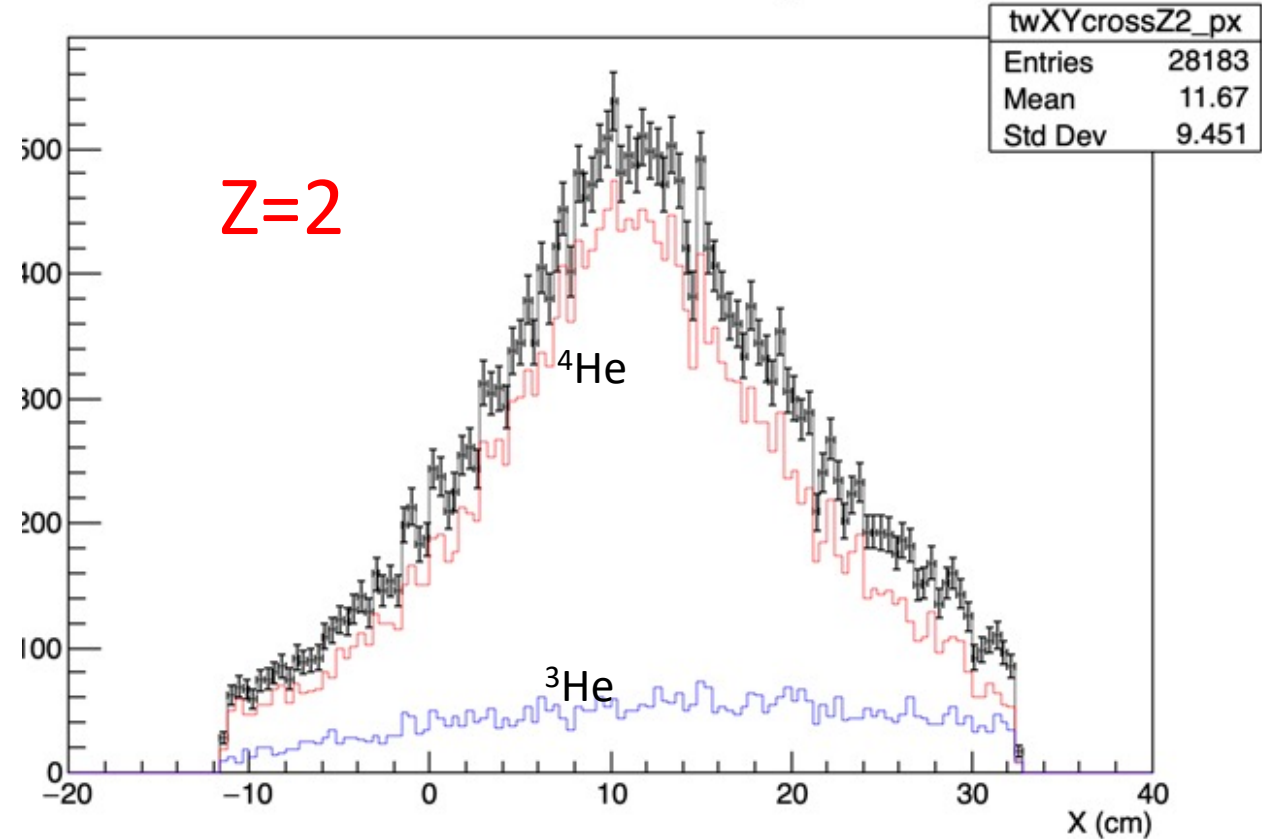
Again: a tiny beam tilt could explain this difference

Lateral distribution on TW

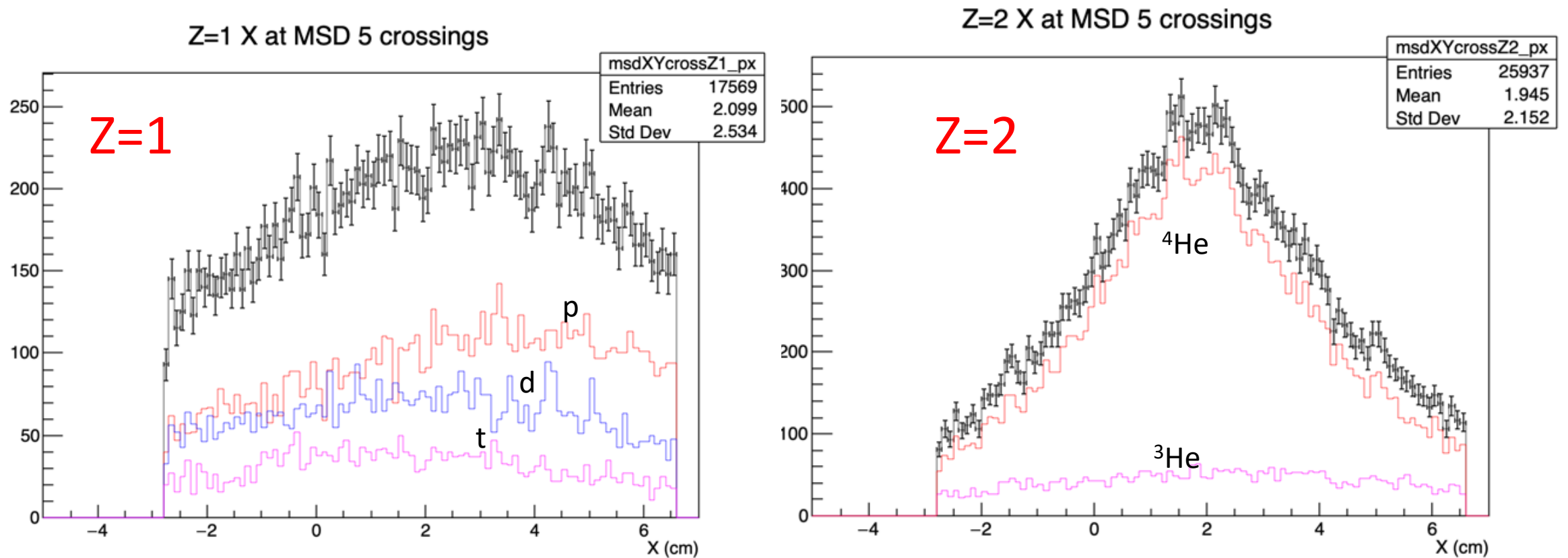
Z=1 X at TW crossings



Z=2 X at TW crossings



Lateral distribution on MSD



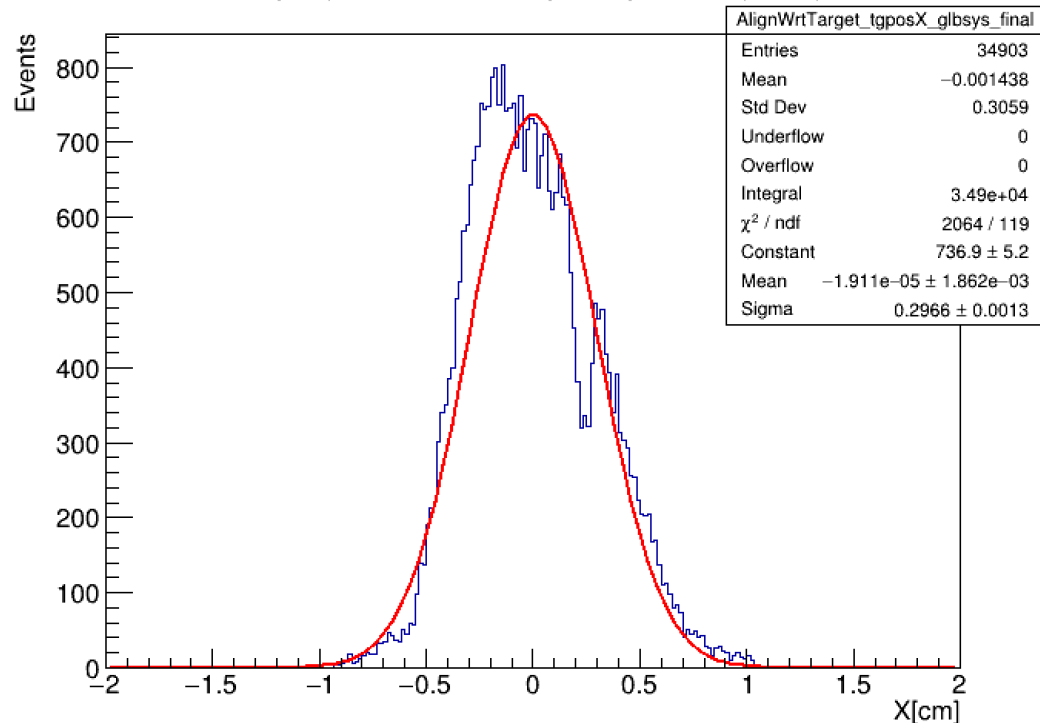
The shift applied to MSD seems to be satisfactory

Open issues - 1

1. Beam shape and position (and possible tilt)

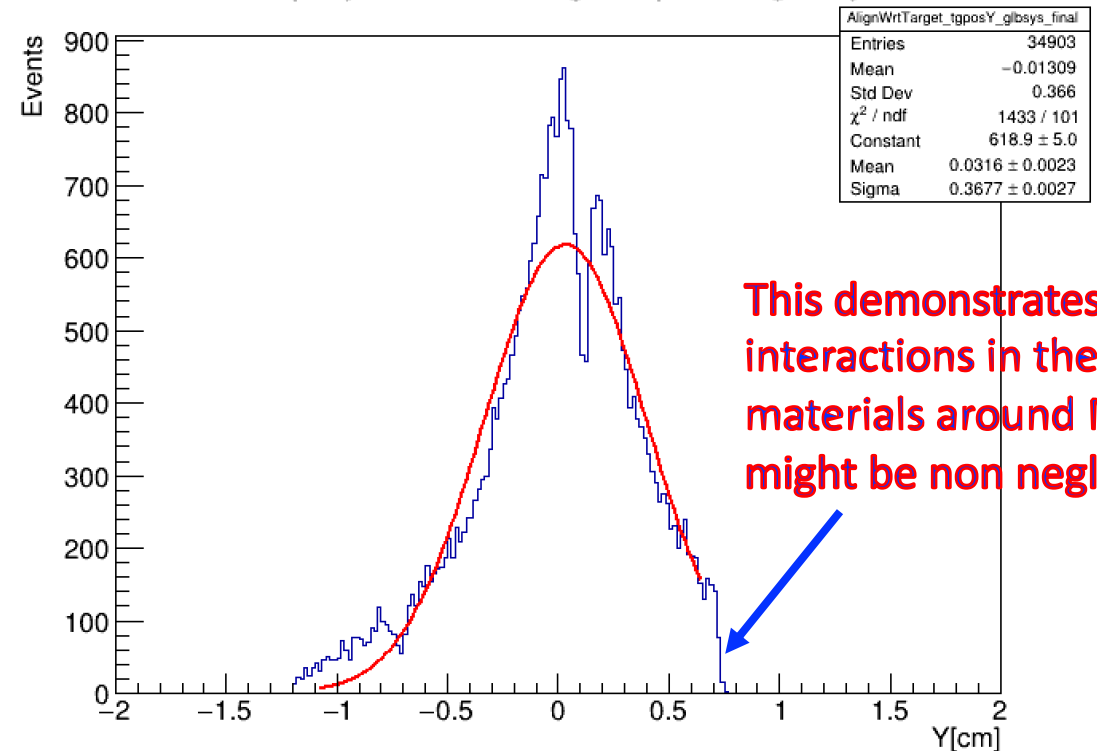
VTX: Run 6102

VT projection on target Xpos in glb sys



Asymmetrical, not centered

VT projection on target Ypos in glb sys



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

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