



EMULSION CLOUD CHAMBER: 2020 GSI RUN

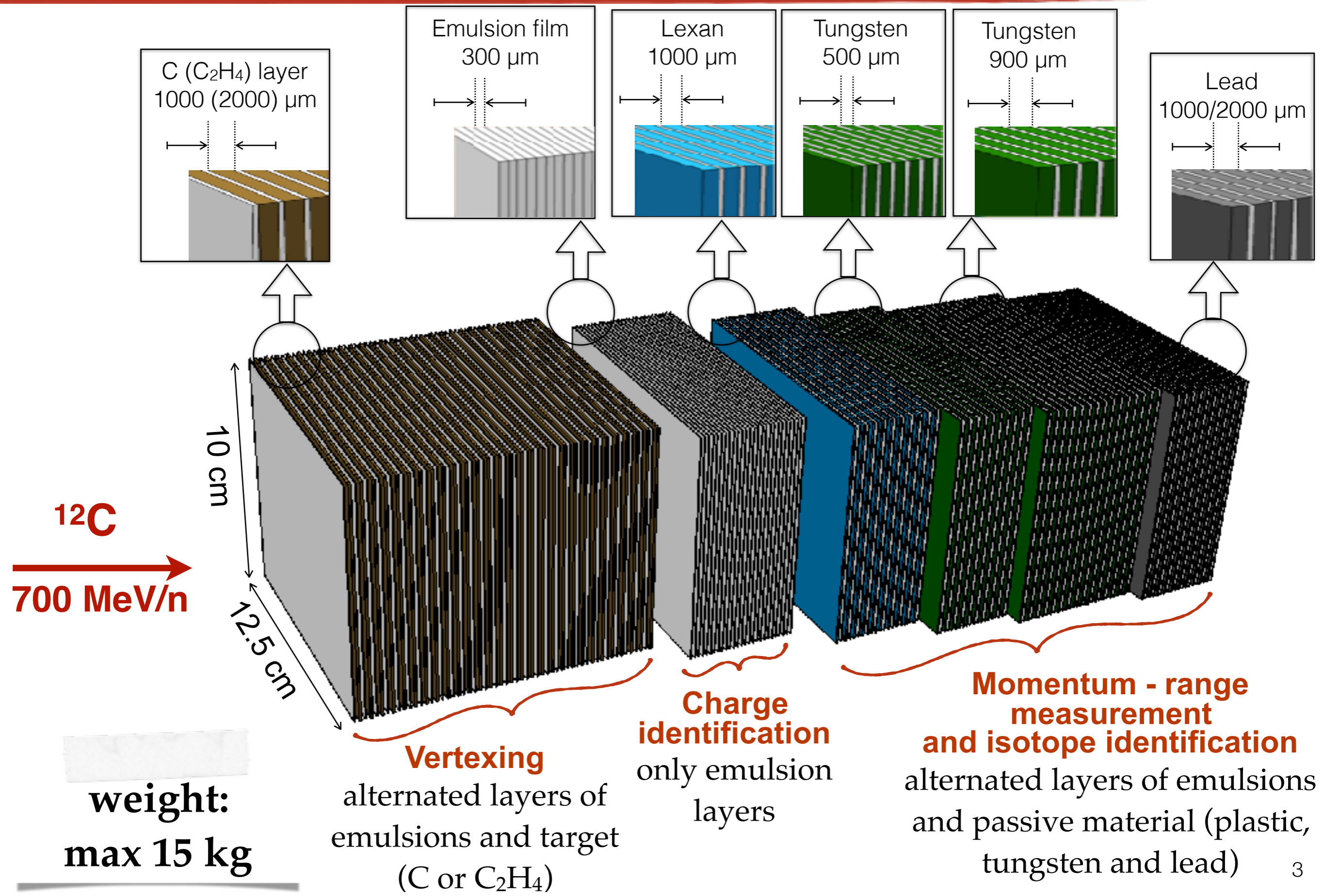
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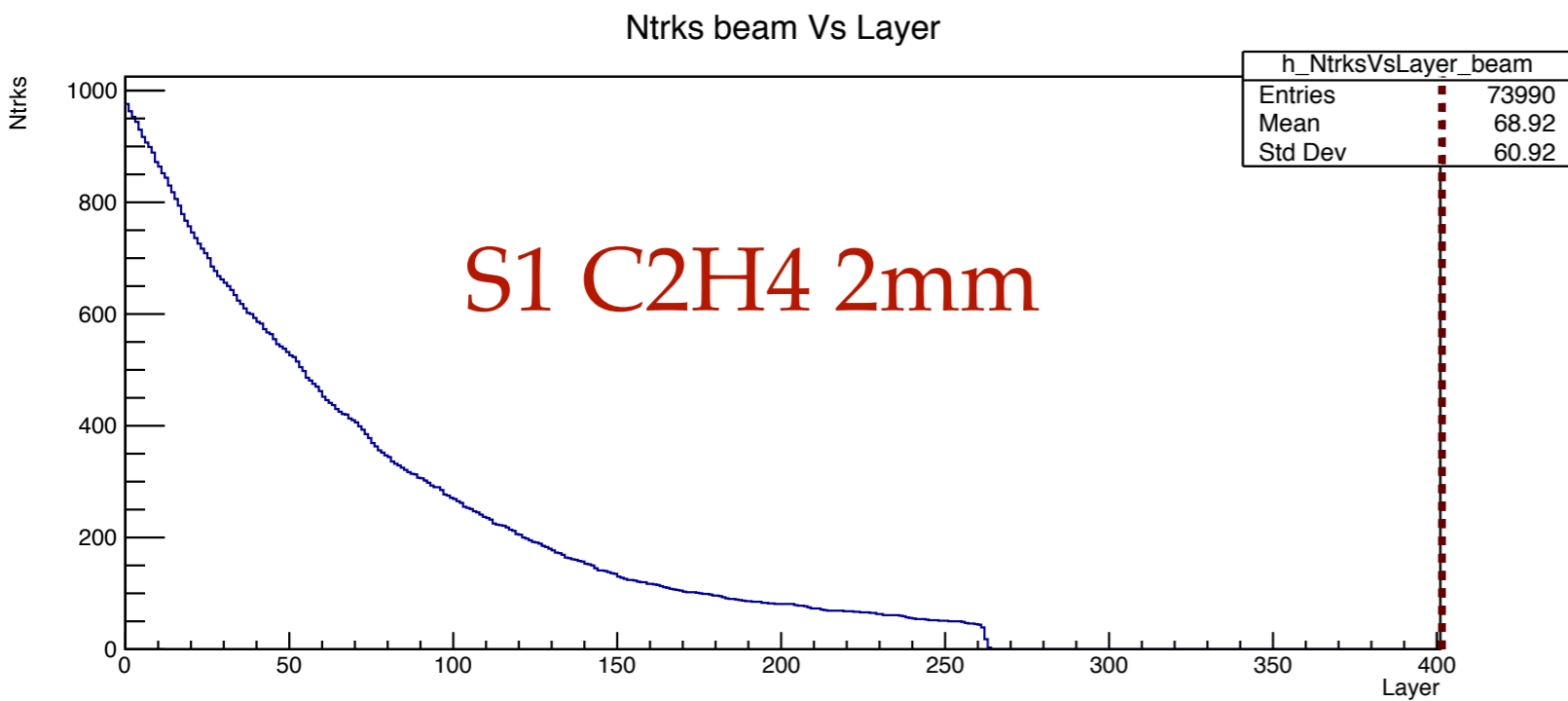
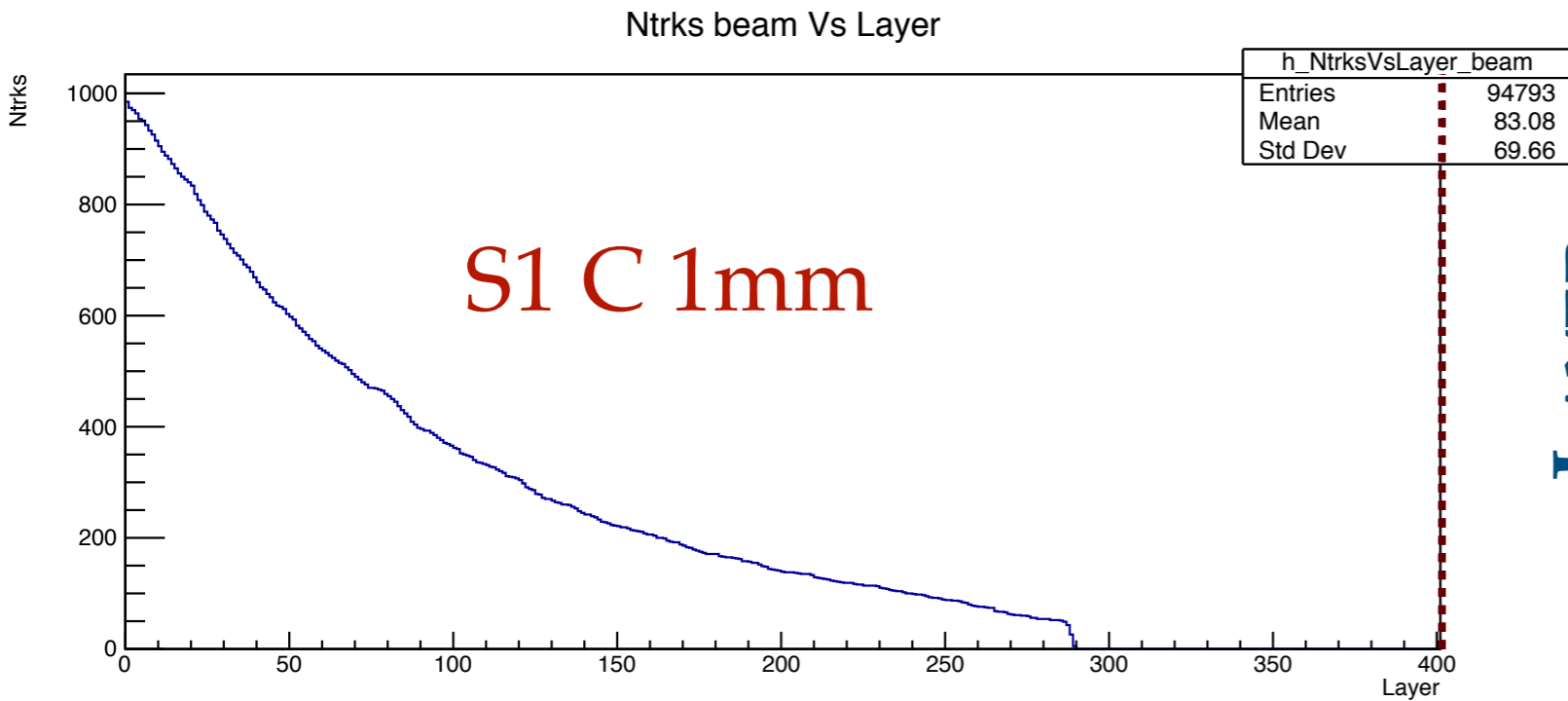
OUTLINE

- 1) **Study of the detector geometry with MC for 700 MeV/n run February 2020 (10-12 February)**
- 2) **Exposure geometry for 2020 February run at GSI**
- 3) **Exposure timeline**

EMULSION SPECTROMETER STRUCTURE



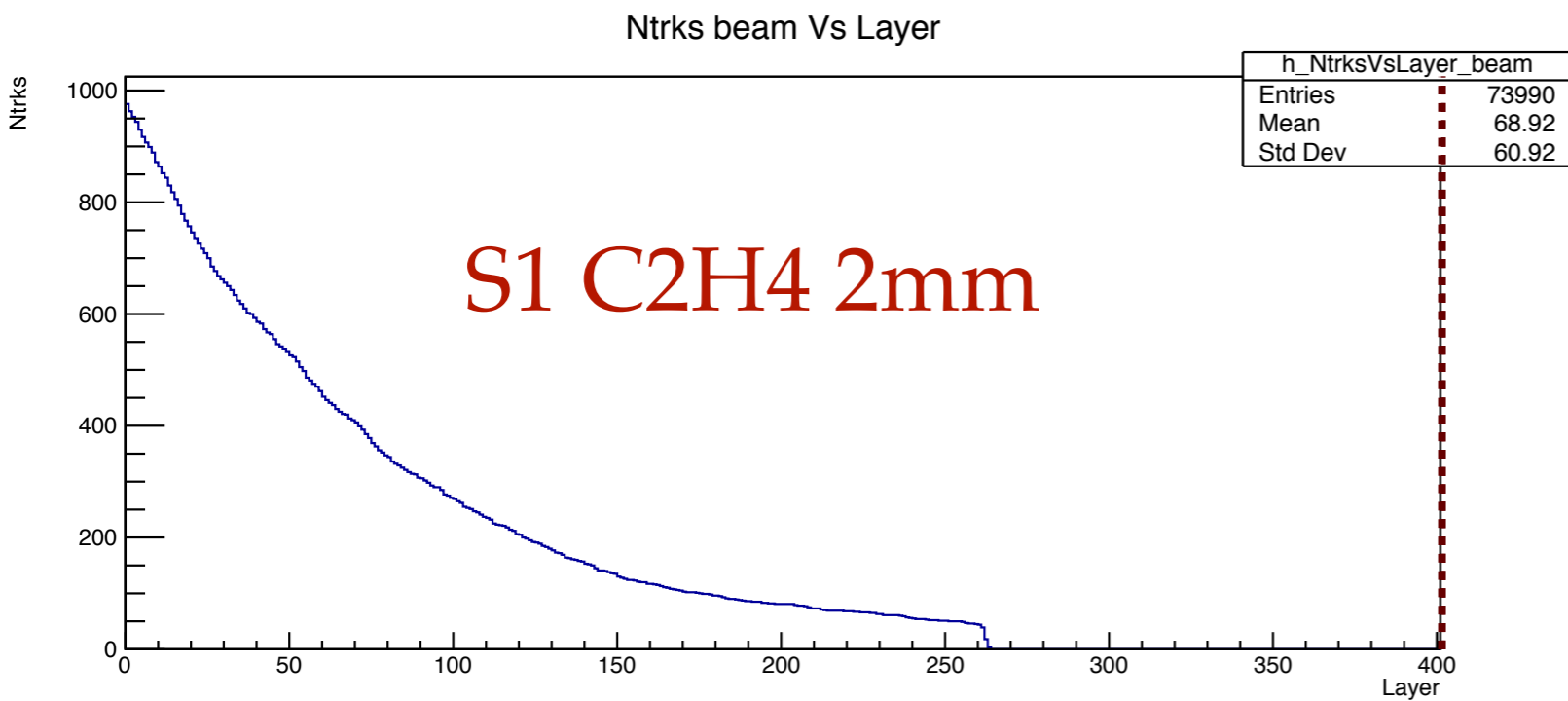
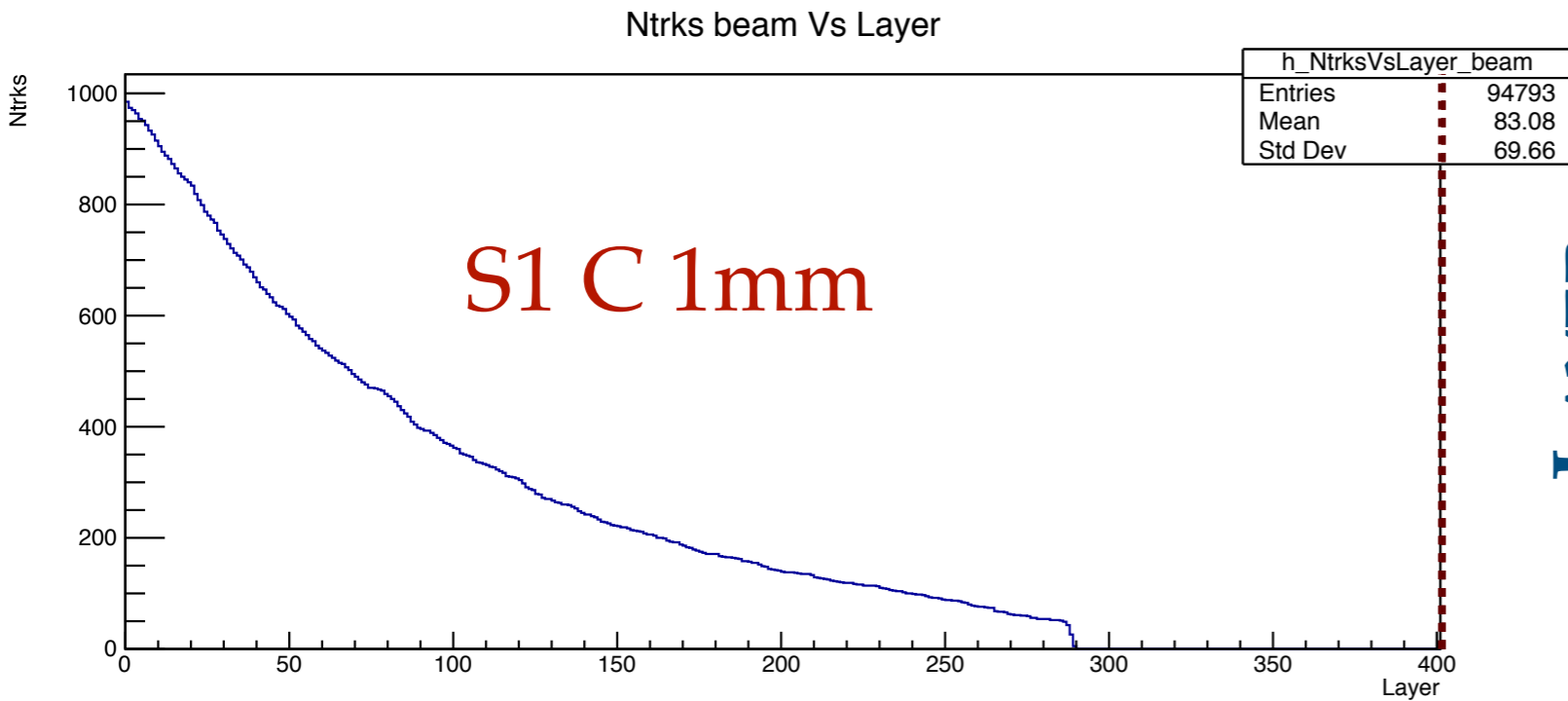
DEFINITION OF TARGET SECTION LENGTH (S1)



	Carbon	C2H4
Beam particles	1000	
Reach S1	99,6%	99,4%
20	23,3%	15,5%
25	28,3%	20,1%
30	33,2%	24,7%
35	36,6%	28,7%
40	40,0%	32,1%
45	43,3%	36,1%
50	46,2%	38,8%
55	49,5%	42,3%
60	53,0%	45,4%
65	56,3%	47,6%
70	58,7%	49,8%
75	61,5%	52,4%
80	64,8%	53,5%
85	67,1%	56,3%
90	68,70%	59,60%
95	70,70%	61,10%
100	72,50%	63,10%

LAYER

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LAYER

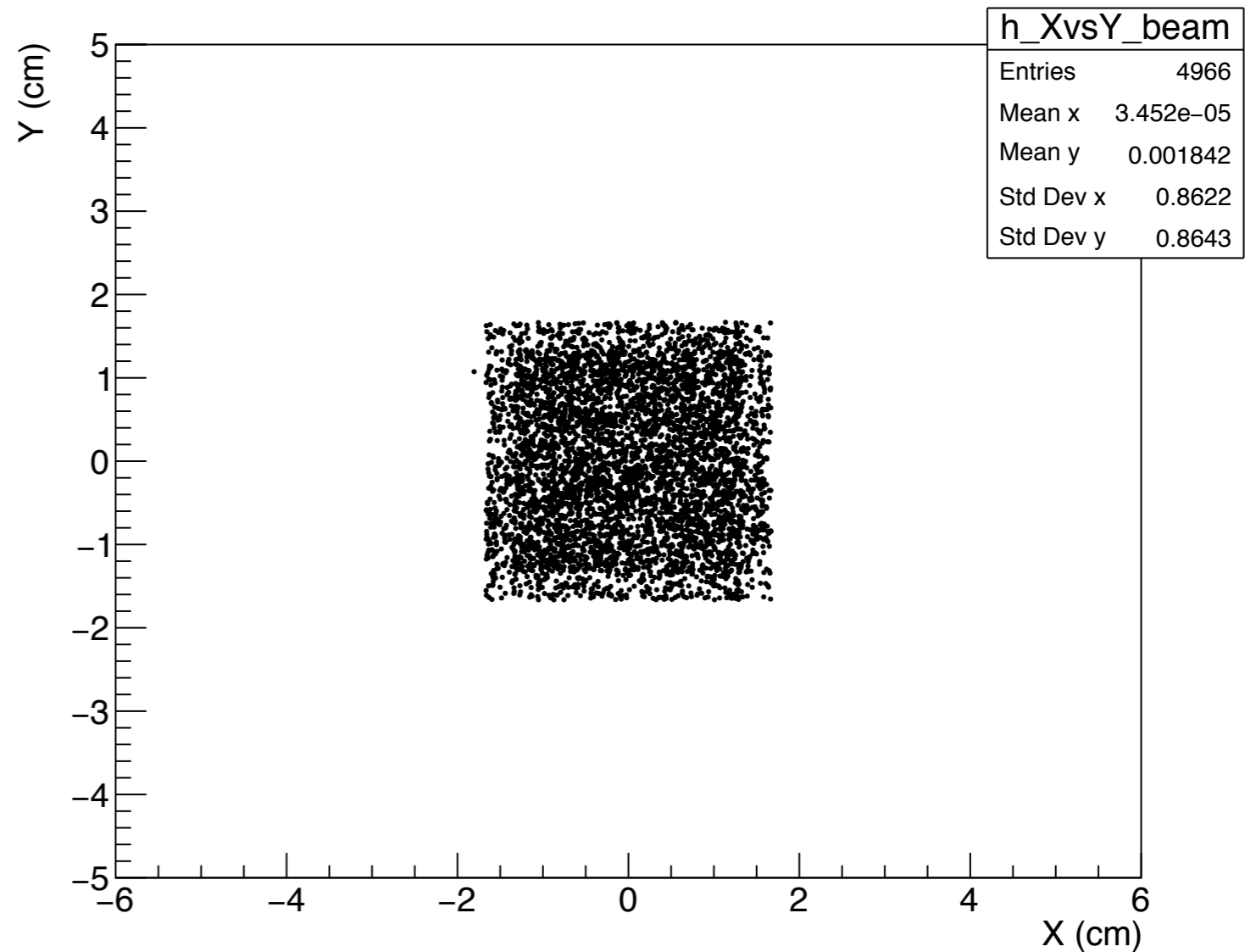
DETECTOR STRUCTURE

	Carbon 700 MeV/n	
S1: C or C2H4 + emu	40	60
S2: emu	37	
S3: Lexan + emu	10	
S4: W (0.5mm) + emu	14	
S5: W (0.9 mm + emu)	14	
S6: Pb (1mm) + emu	40	
S7: Pb (2mm) + emu	10	

BEAM CHARACTERISTICS

- Carbon @ 700 MeV/n
- Rectangular Shape
- Isotropic distribution
- @-30cm in z
- 5000 events

Beam position at Z=0



INTERACTIONS

		TARGET	
		Carbon	C2H4
S1_40	Beam particles	5000	
	Reach S1	99,3%	99,1%
	VTX in S1	32,5%	40,0%
	Charge measure in S2 (% w. respect to total products)	78,7%	76,2%
	Charge + range meas. (% w. respect to total products)	39,0%	37,3%
S1_60	VTX in S1	44,0%	51,1%
	Charge measure in S2 (% w. respect to total products)	70,4%	66,3%
	Charge + range meas. (% w. respect to total products)	35,2%	32,2%

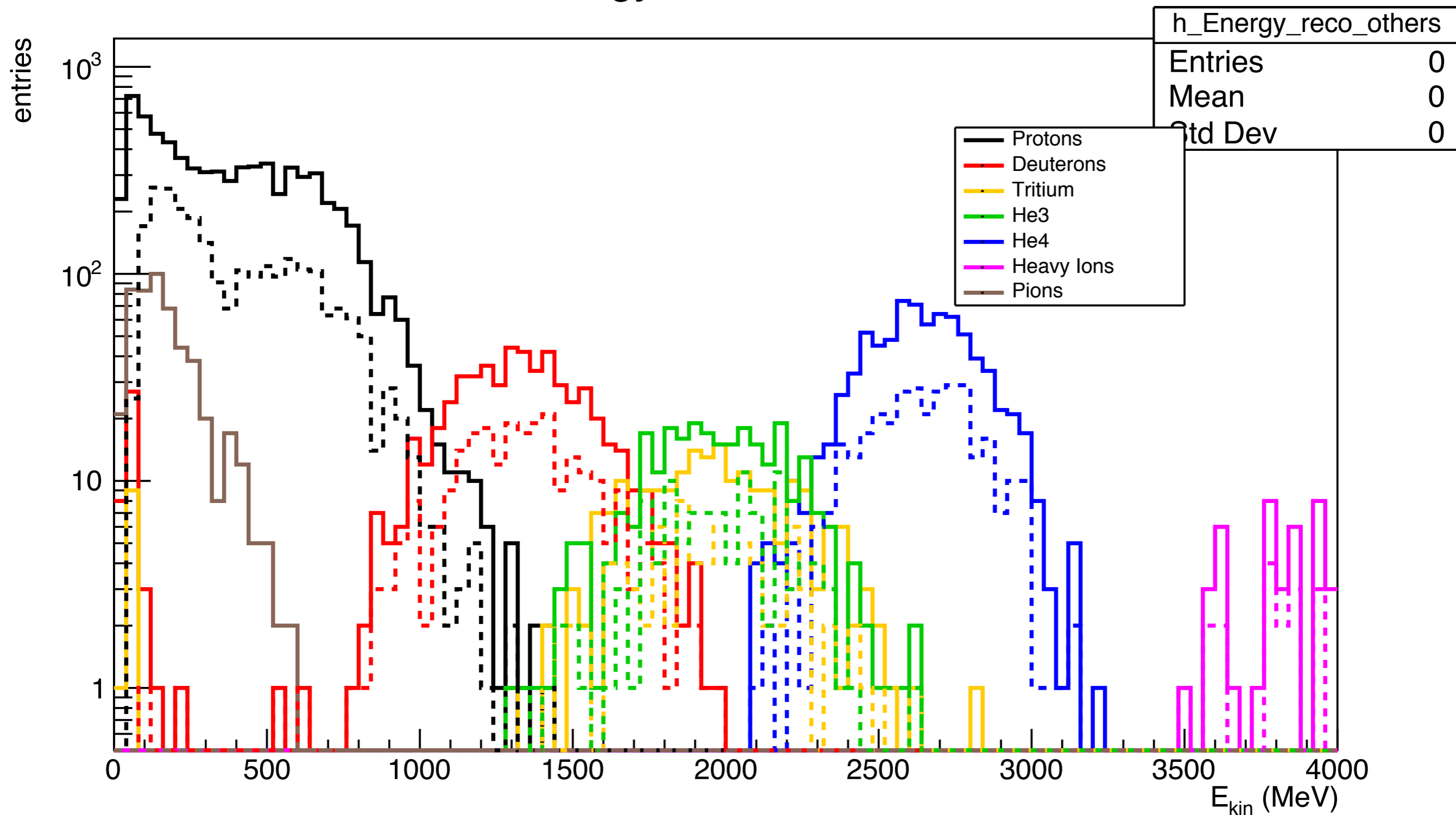
INTERACTIONS

TARGET

		Carbon	C2H4
Beam particles		5000	
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S1_40	VTX in S1	32,5%	40,0%
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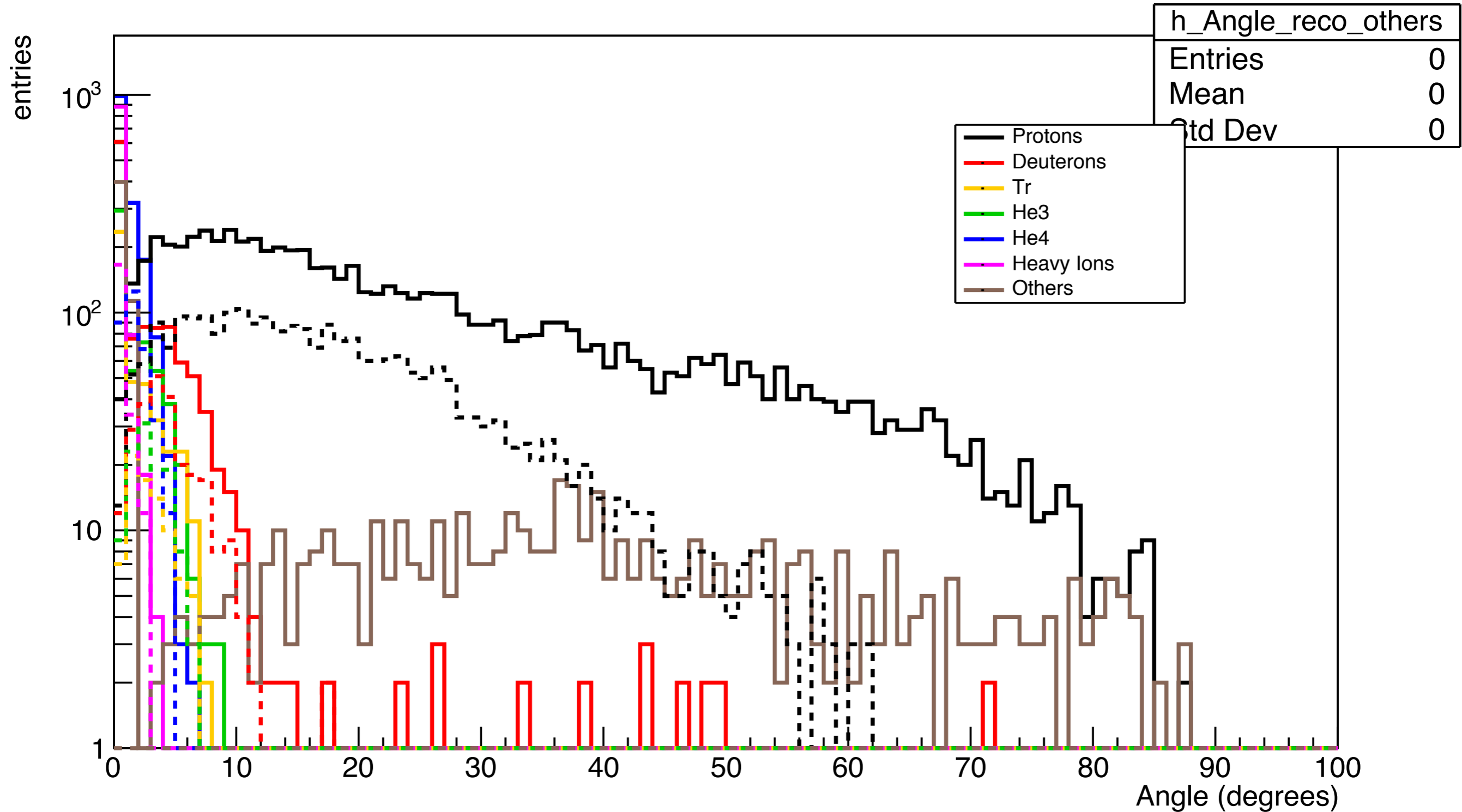
S1 CARBON (1MM X40 LAYERS)

Energy distribution S1



S1 CARBON (1MMX40 LAYERS)

Angle distribution S1



EMULSION SPECTROMETER MATERIAL

^{12}C BEAM	TARGET	n° emulsions	n° C 1mm	n° C ₂ H ₄ 2mm	n° lexan 1mm	n° W 0.5mm	n° W 0.9mm	n° Pb 1.0mm
700 MeV/n	C	175	40		10	14	14	60
	C ₂ H ₄	175		40	10	14	14	60
TOT		350	40	40	20	28	28	120

- ✓ For this run the emulsions will be provided by Slavich Company (Russia)
- ✓ Delivery foreseen for middle of January

BEAM CHARACTERISTICS

Beam characteristics

- ▶ Field Size: 2.5x2.5 cm²
- ▶ Max density: 5000 particles / cm²

BEAM	TARGET	BEAM INTENSITY (N° particles/ 6.25cm ²)	INTERACTION PROBABILITY	VERTEX MULTIPLICITY	CONTAINED FRAGMENTS	N° RECONSTRUCTED FRAGMENTS
¹²C @ 700 MeV/n	C	14x10³	33%	6,8	39%	~12x10³
	C ₂ H ₄	14x10³	40%	6,0	37%	~12x10³

FRACTION OF RECONSTRUCTED FRAGMENTS

$^{12}\text{C}@700\text{MeV/n}$ on C

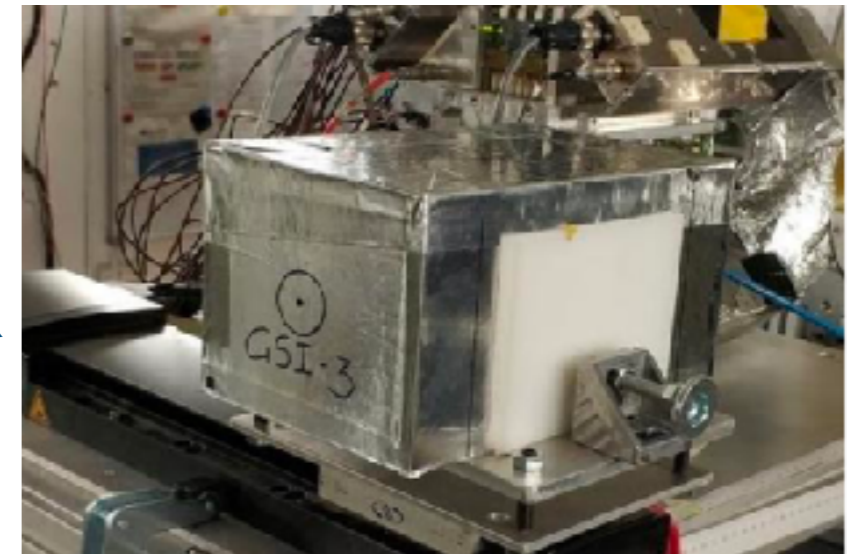
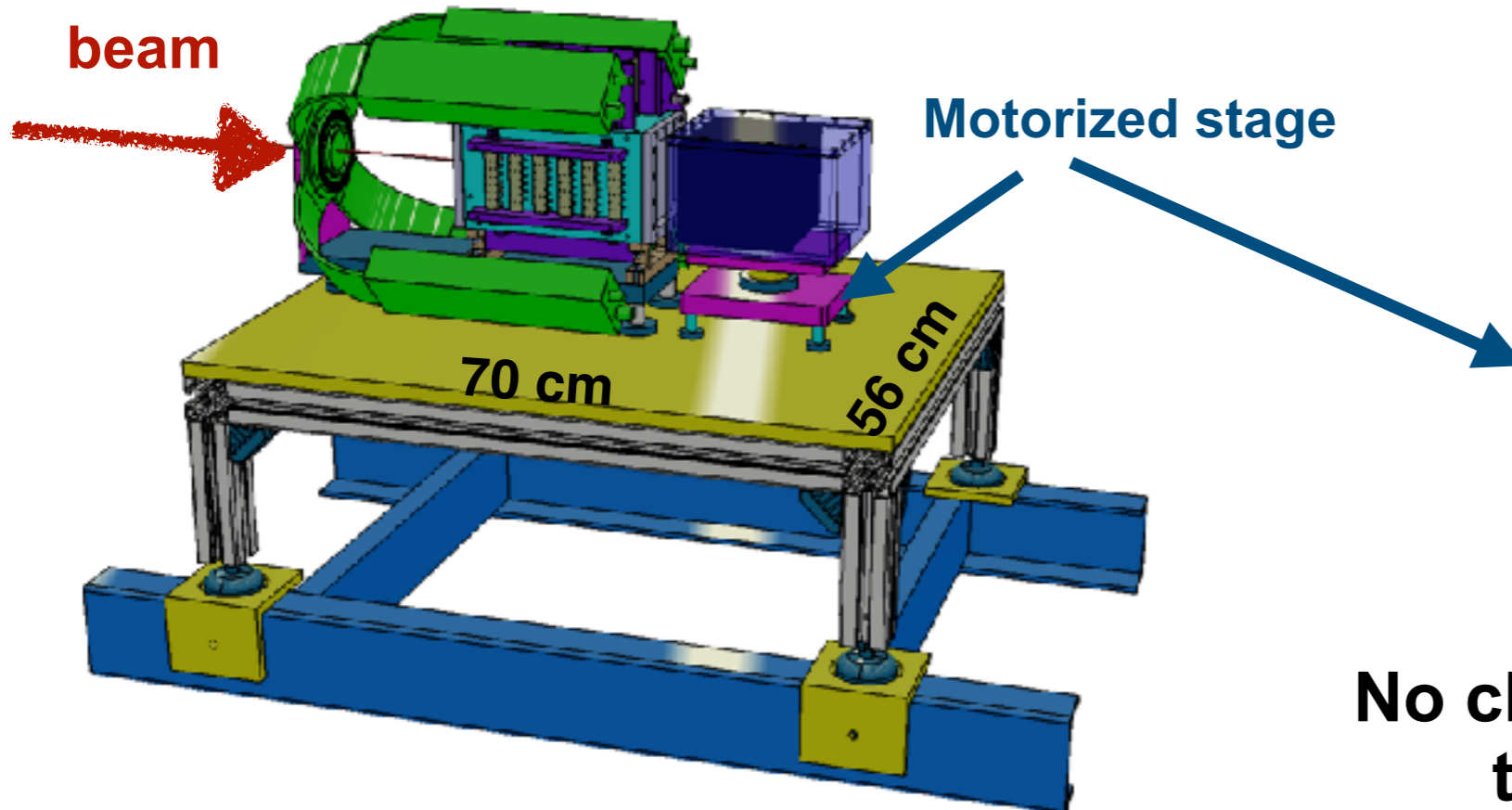
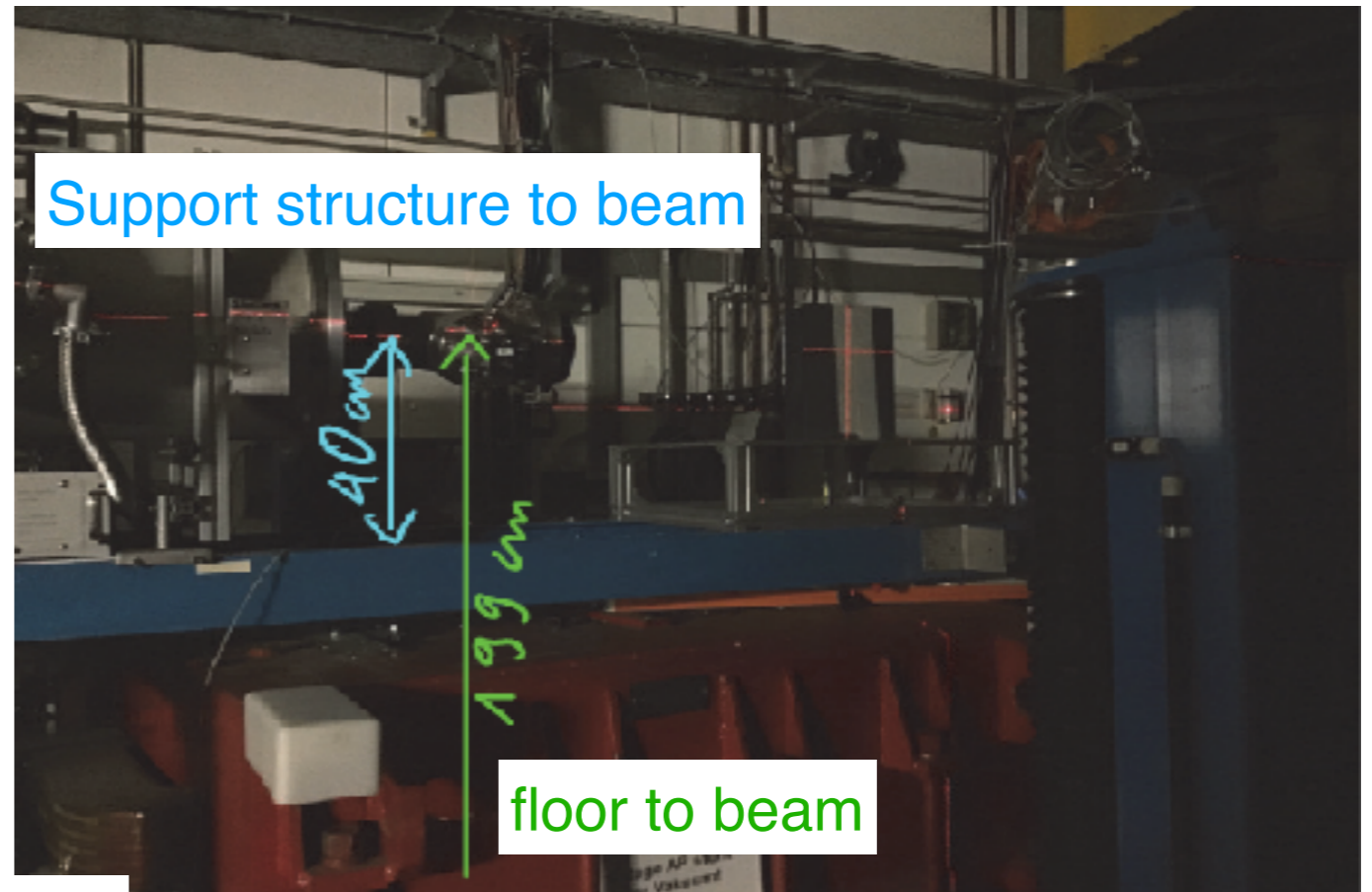
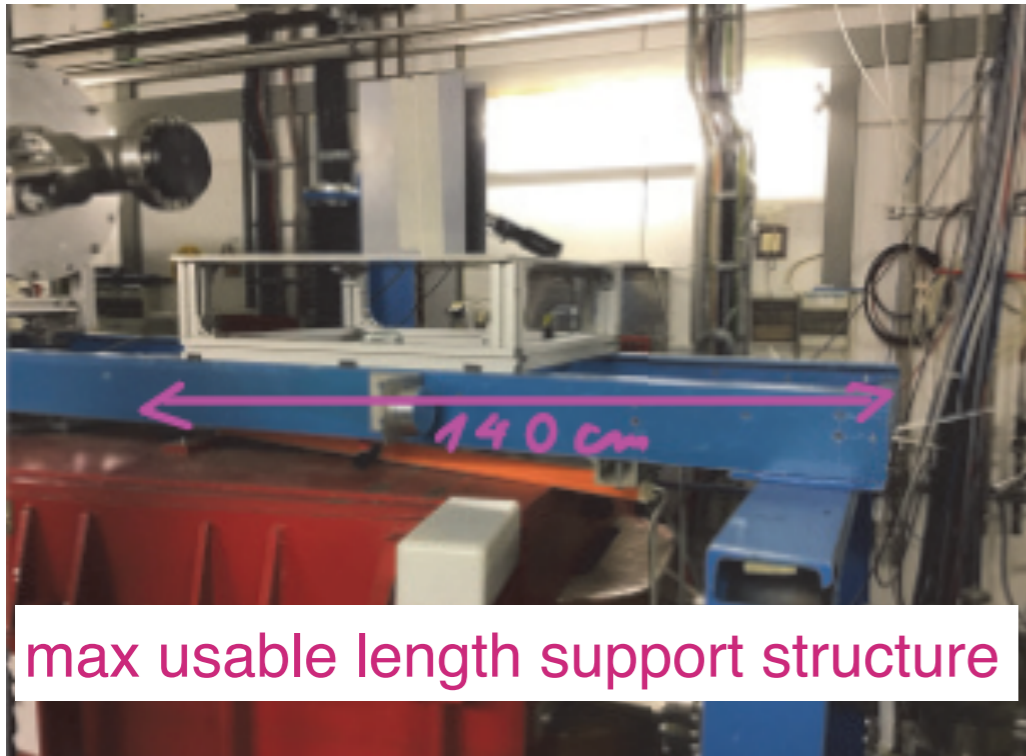
P	67%	8×10^3
D	7%	800
Tr	3%	300
^3He	3%	300
^4He	10%	10^3

$^{12}\text{C}@700\text{MeV/n}$ on C_2H_4

P	58%	7×10^3
D	9%	10^3
Tr	3%	400
^3He	3%	500
^4He	14%	2×10^3

GEOMETRY EXPOSURE: GSI 2020 RUN

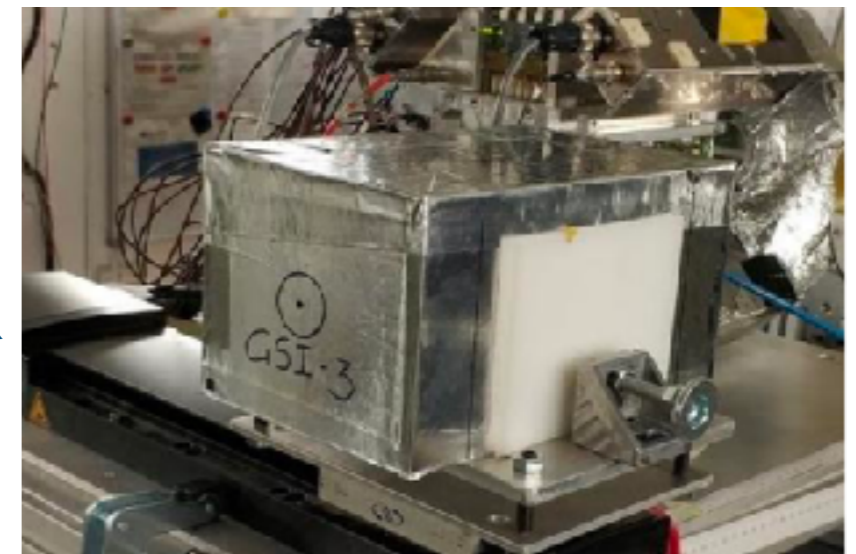
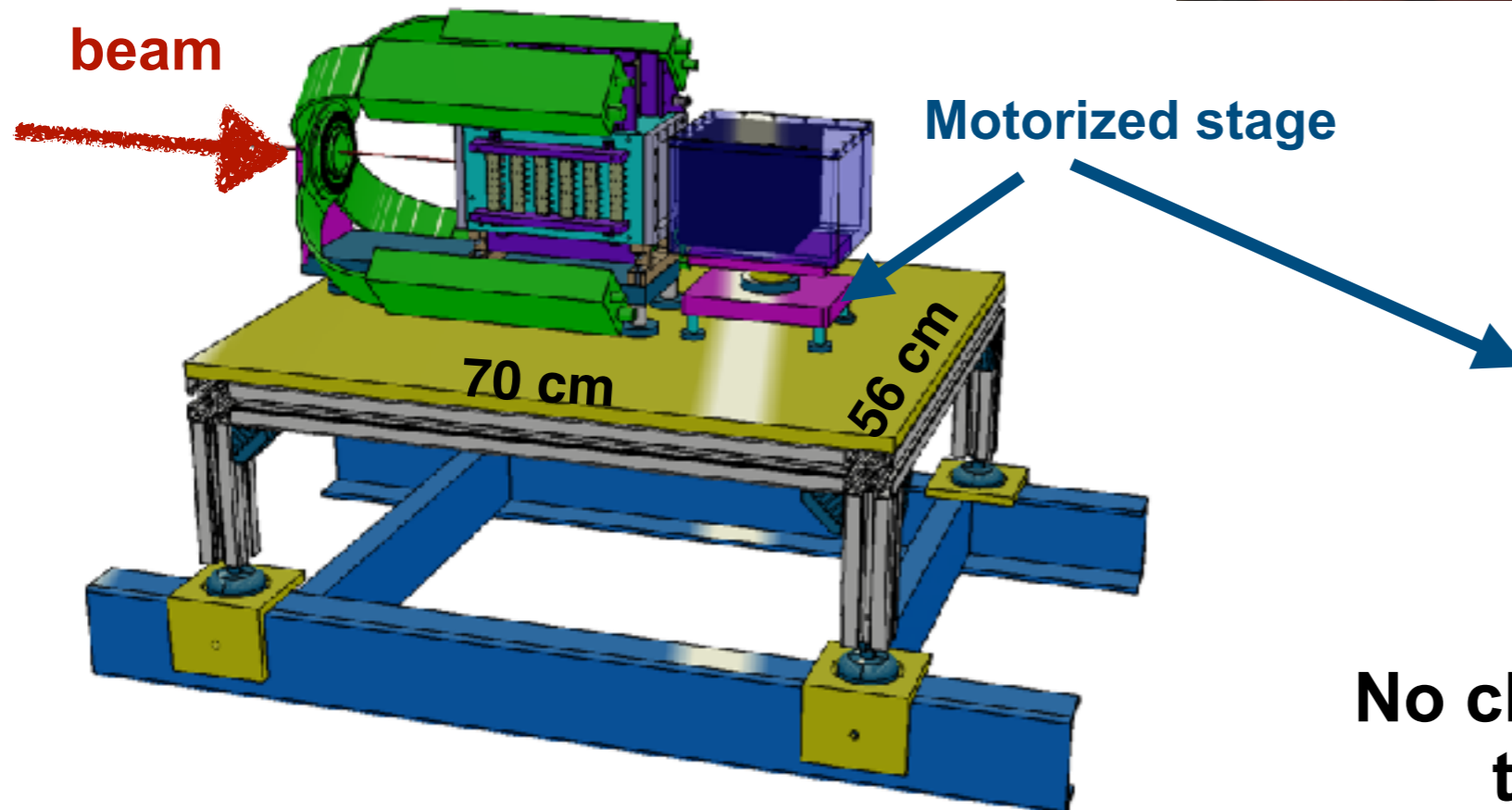
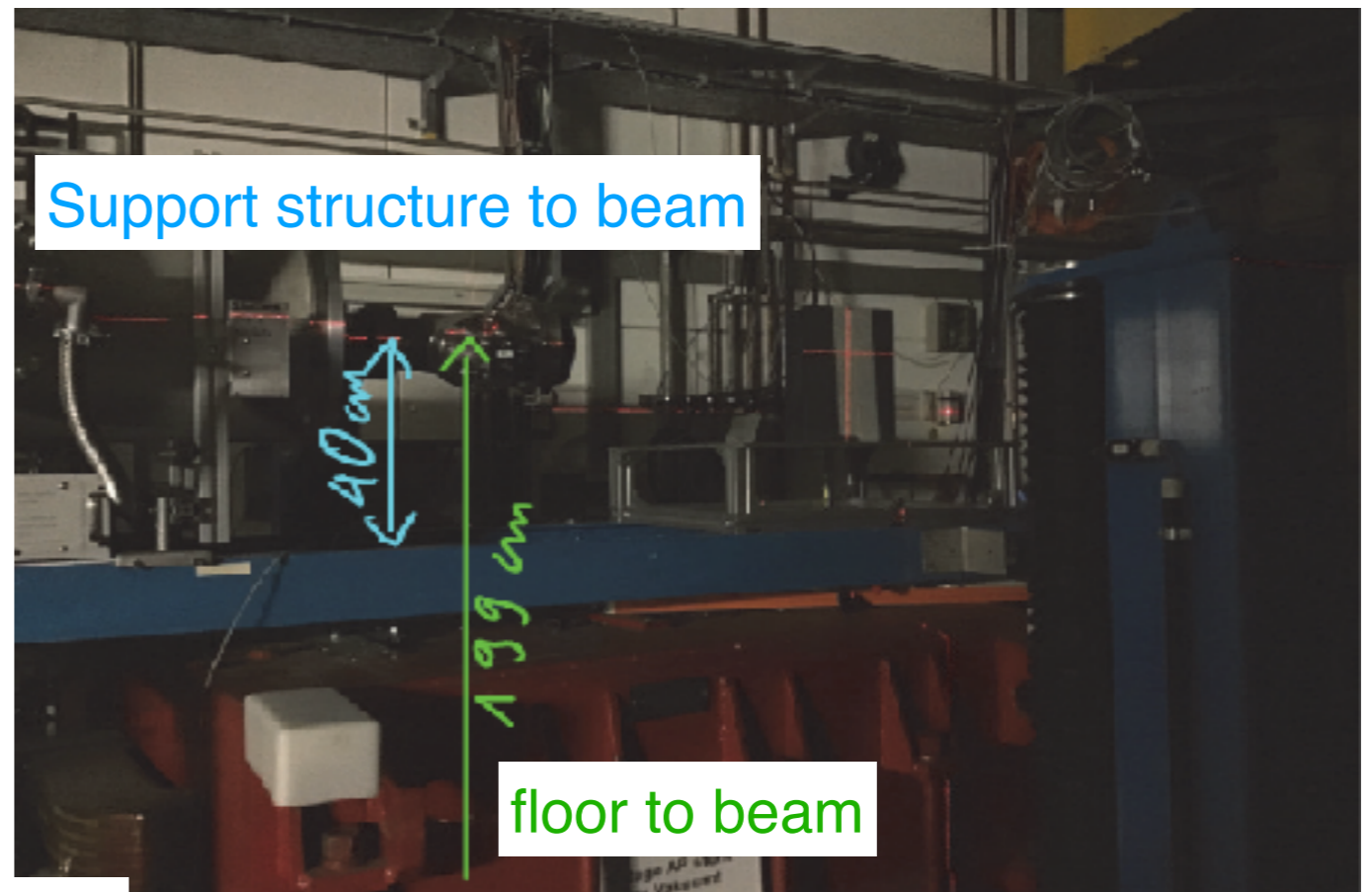
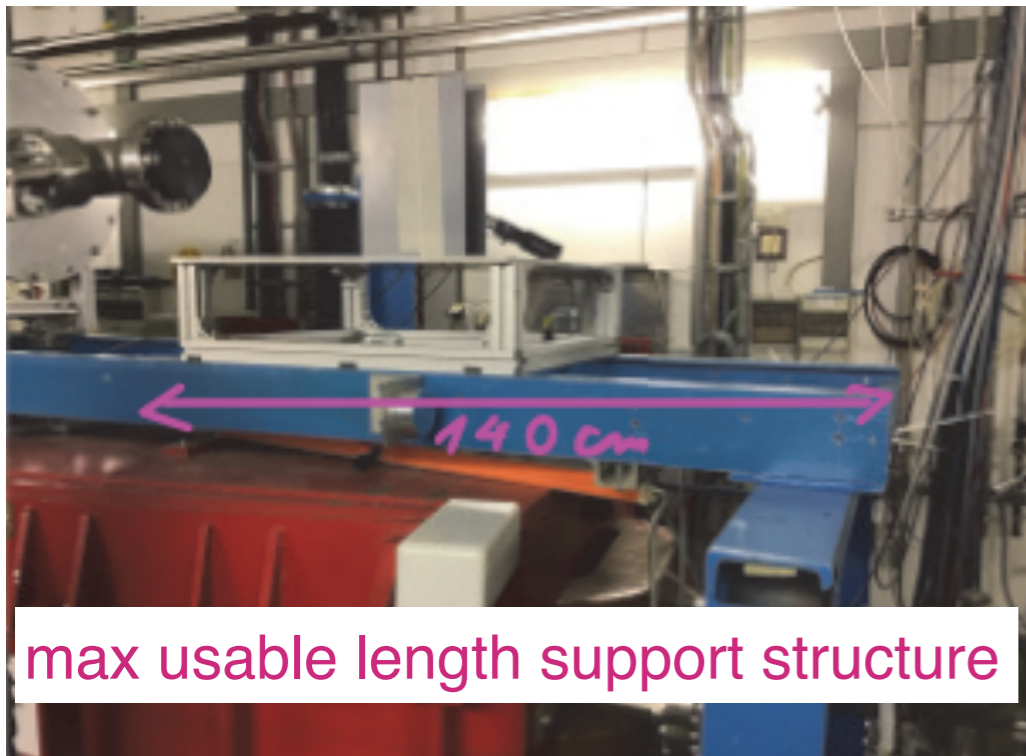
CAVE A



No change with respect to the 2019 April run

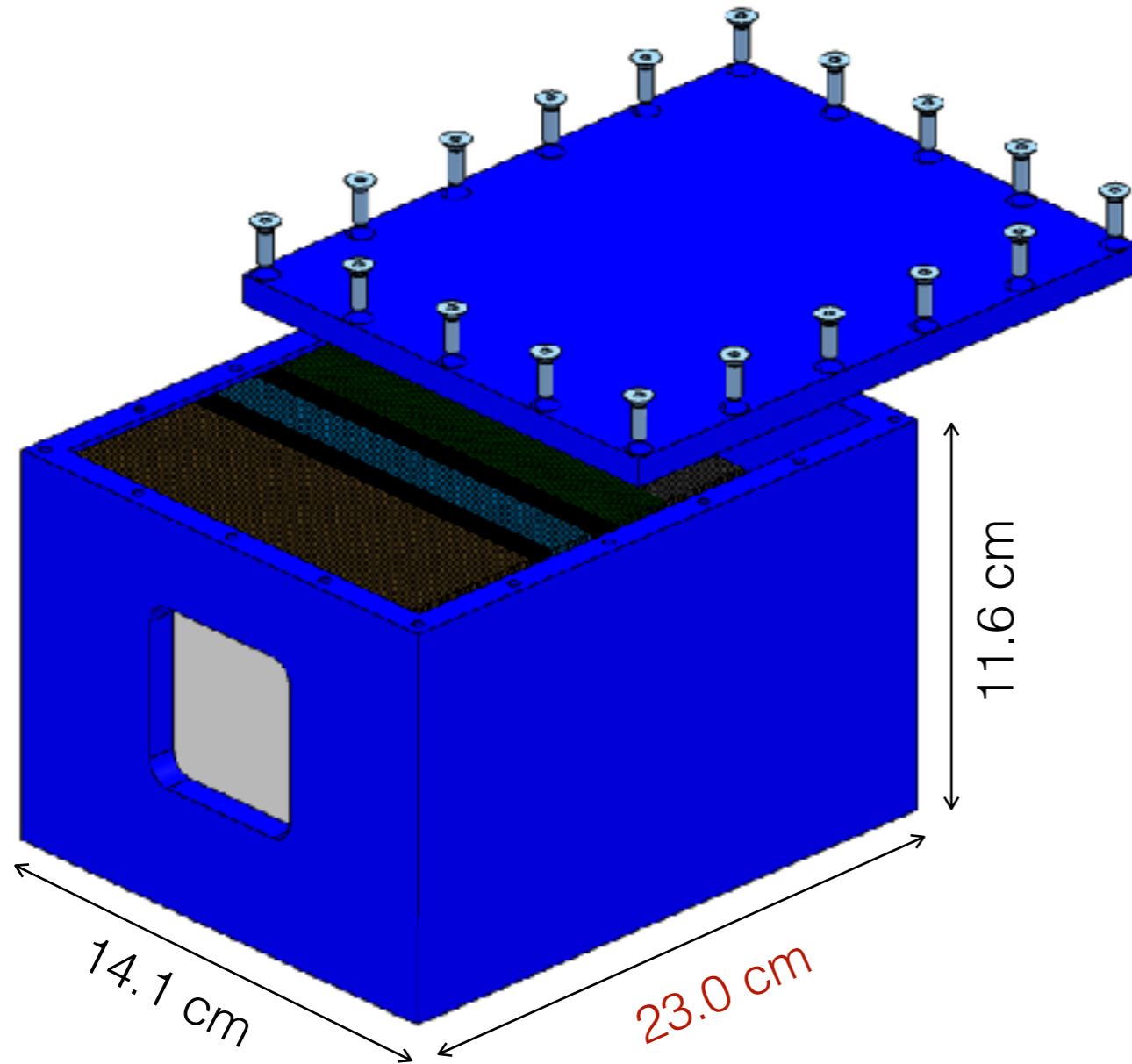
GEOMETRY EXPOSURE: GSI 2020 RUN

CAVE A



No change with respect to the 2019 April run

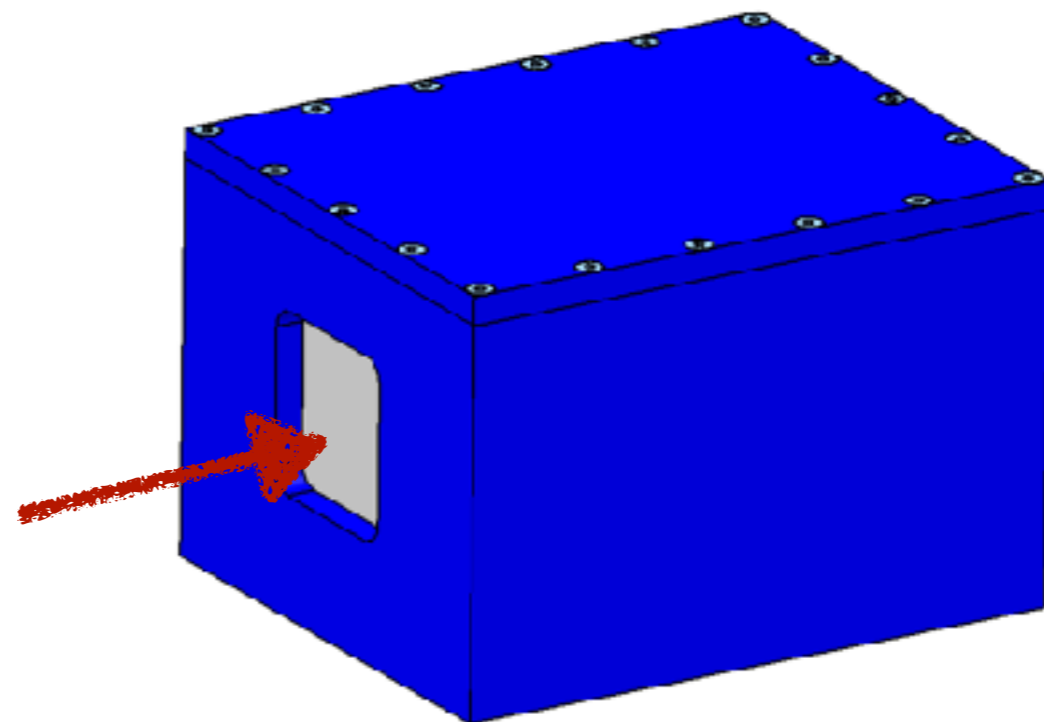
EMULSION CHAMBER



Emulsions chamber:

- ▶ plastic material (ABS)
- ▶ 3D printer
- ▶ 0.8-1.0 cm thickness
- ▶ 5x5 cm² window
- ▶ 14.1x**23.0** x11.6 cm³
- ▶ 2 ECC are under construction

beam



EXPOSURE TIMELINE

10 February 2020

