

JLab Meeting

- PCS
- Solid target & frame
- Drawing of Hall-C option

Tohoku University

Sho Nagao

2021/10/07

PCS

PCS magnets are stored in a storage building of Nittsu company (shipping company).

We are waiting for finishing the contract procedure between Tohoku Univ. and TOKIN, it will be done sometime in November.

Overseas transportation will be taken 2~3 months. PCS will arrive January or February in 2022.

I'm asking TOKIN more detail schedule to arrange discharging at JLab.

Photos after packing PCS magnets



Target (Requirements)

1. Multi-foil

Multi-foil target holder is necessary getting high hypernuclear yield. Multi-foil target should adopt in light-mass targets (CH_2 to C). If the data taking rate will be relaxed, multi-foil for mid-mass target (Al and Ca) will be tried. Pb will be used as a single foil because high trigger rate will be expected. Each multi-foil group consists two or three series targets with 10 cm distance in order to separate on z vertex distribution of HRS. In case of two foils, targets are set at $z = \pm 5$ cm. In case of three foils, at $z = \pm 10$ and 0 cm. Therefore, target base that has removable holder at $z = 0, \pm 5$, and ± 10 cm is necessary.

2. Coolant

Effective target cooling is necessary, especially for Pb target due to its small thermal conductivity and low melting point. Coolant with low temperature (about 15K) is necessary. We would like to use the same coolant with cryo. gas target.

3. Remote Control

Targets will be changed from the counting room. Remote controller is necessary.

4. Robustness

Targets have to be hold with holders. The holder that the target never drop off is important. Target position must be controlled with a precision of $< 200 \mu\text{m}$ for beam (z) direction and $< 1 \text{ mm}$ for x & y direction is necessary.

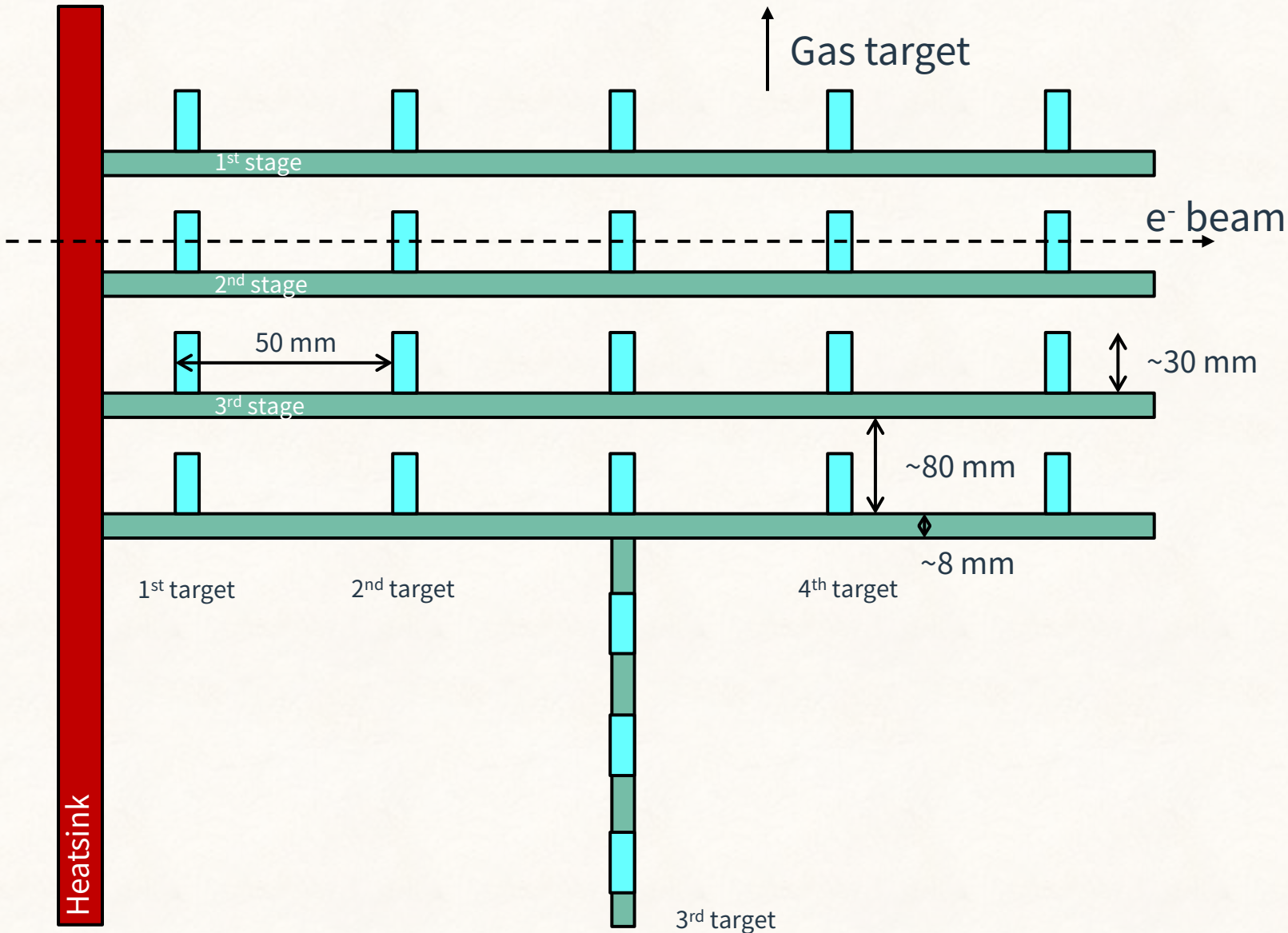
5. Visible monitor

Visual monitor of the beam position is necessary. BeO with scale mesh and a visible camera is one of the candidate. Beam position check with a carbon hole target is also fine.

6. Geometrical Restriction

Particles should go into spectrometers without any hits in other materials to keep good resolution. Target width should be less than 8mm for HRS side and 13mm for HKS. ($10 \text{ cm} \times \tan(5^\circ) = 8.7 \text{ mm}$)

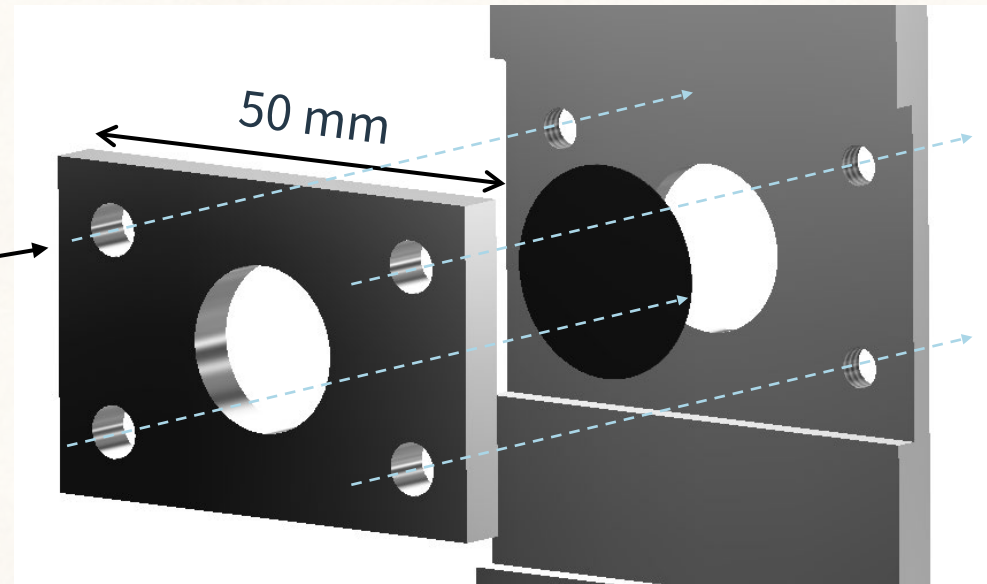
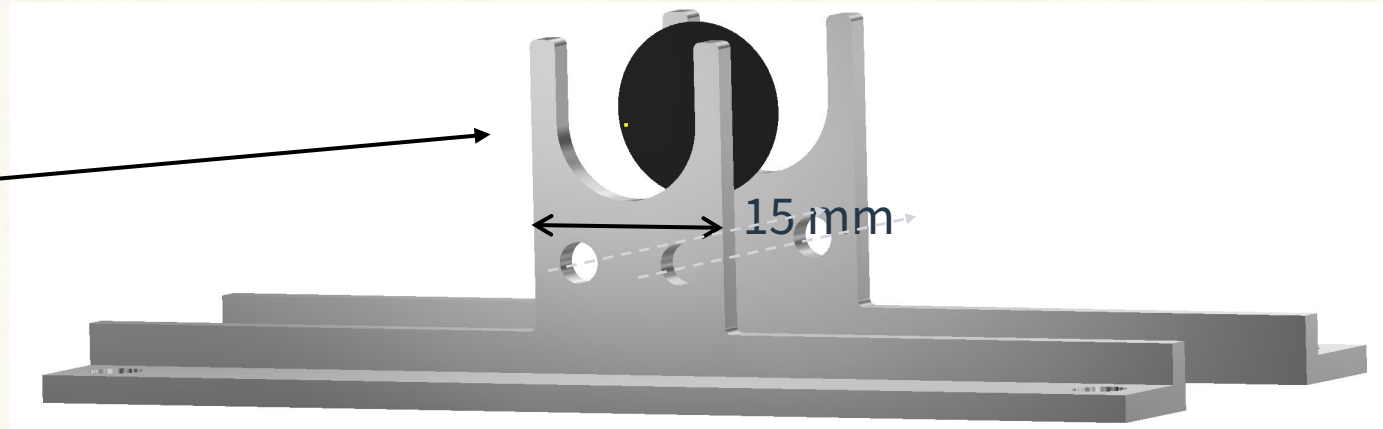
Target (List & Cartoon)



Example 1

	1st	2nd	3rd	4th	5th
1st	²⁷ Al		²⁷ Al		²⁷ Al
2nd	¹² C		¹² C		¹² C
3rd	CH ₂		CH ₂		CH ₂
4th	B		B		B
5th	⁹ Be		⁹ Be		⁹ Be
6th	Li		Li		Li
7th	¹² C		⁴⁰ Ca		⁴⁰ Ca
8th	¹² C		⁴⁸ Ca		⁴⁸ Ca
9th			BeO		
10th			Chole		
11th			²⁰⁸ Pb		

Target (Drawing)

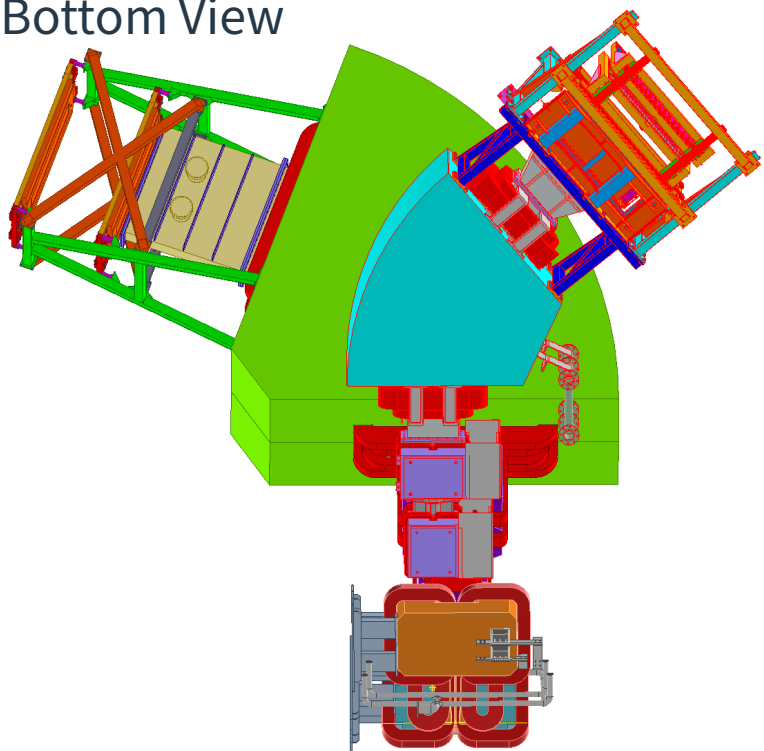


Drawing (Hall-C option)

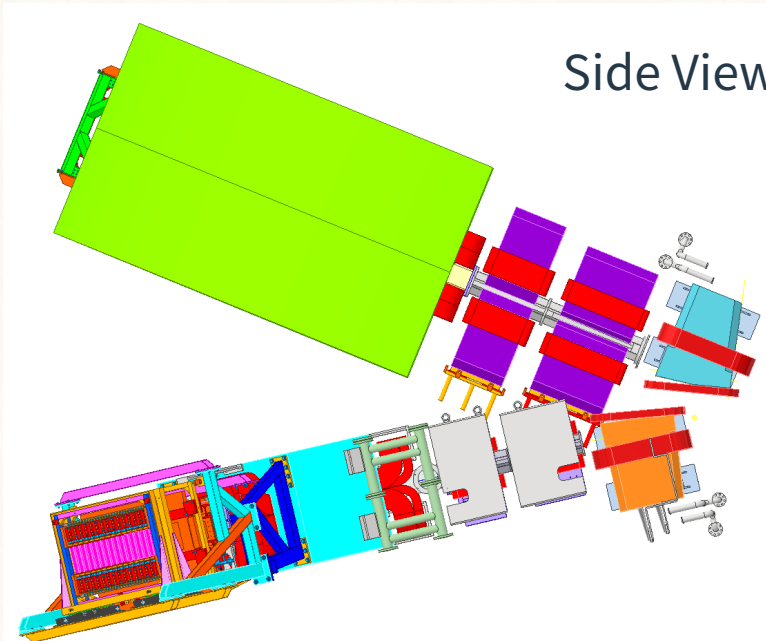
Combination of PCSs, HKS, and HES.

Vertical bending with PCS & Horizontal bending with HKS & HES.

Bottom View



Side View



Bird's-eye view



Drawing (Hall-C option)

Combination of PCSs, HKS, and HES.

Horizontal bending with PCS & Vertical bending with HES. HKS is horizontal bending.

