

Boiling run study with Ytar distribution

Date	@05/02/2024
Event	Research
Tags	Jab_NPS

Data set

- Electron selections: $H_cer_npeSum > 2 \ \&\& \ H_cal_etottracknorm > 0.6$
- LD2 and LH2 boiling runs are the same as Yaopeng used in the boiling study

Run number	Target	ps4	prescale factor	beam current
1514	LH2	0	1	5
1515	LH2	2	3	10
1516	LH2	3	5	15
1517	LH2	4	9	25
1518	LD2	7	65	40
1519	LD2	6	33	25
1520	LD2	6	33	18
1521	LD2	5	17	10
1522	LD2	4	9	5

- No dummy runs for boiling, so the dummy run with the same kinematic setting is used for subtraction

Run number	Target	ps3	prescale factor	beam current
1683	Dummy	2	3	30

Dummy thickness normalization

- Normalize the dummy thickness to upstream and downstream wall of LH2 and LD2 chamber for the subtraction
- Based on the Hall C Target Configuration September 2023
(
<https://logbooks.jlab.org/files/2023/08/4172378/TGT-RPT-23-001.pdf>)

4 Target Thicknesses

4.1 Cells

Hydrogen loops entrance and exit window thicknesses are given below. Loop 1 is in standby with helium gas. Loop 2 is connected to the H2 panel and Loop 3 is connected to the D2 panel.

Target	Entrance (mm)	Exit (mm)	Length (mm)	Material
Loop 1 (10 cm)	0.130 ± 0.012	0.188 ± 0.013 Tip 0.184 ± 0.017 wall	100 ± 0.26	Al 7075
Loop 2 (10 cm)	0.150 ± 0.011	0.191 ± 0.019 Tip 0.219 ± 0.018 wall	100 ± 0.26	Al 7075
Loop 3 (10 cm)	0.116 ± 0.0086	0.184 ± 0.021 Tip 0.14 ± 0.023 wall	100 ± 0.26	Al 7075

Entrance windows are fabricated from Al7075 (lot 377271B2)
[CMTR HT 377271B2 | Jefferson Lab Electronic Logbook \(jlab.org\)](#)

Exit windows are fabricated from Al7075 (lot # 308151)
[Material Certification \(lot # 308151\) for Al7075 to be used for Hall C 10 cm exit windows | Jefferson Lab Electronic Logbook \(jlab.org\)](#)

4.2 Dummy Targets

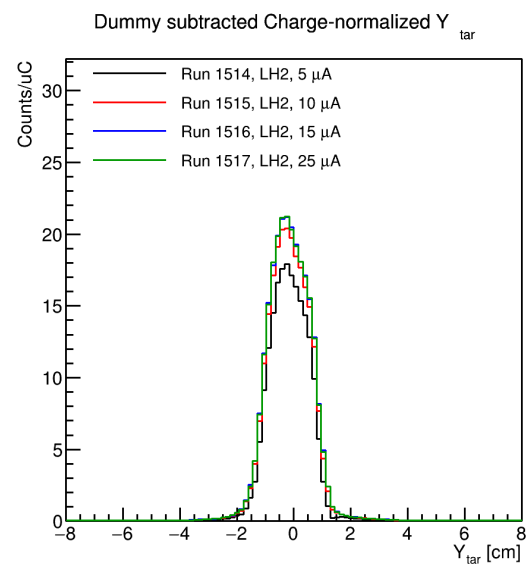
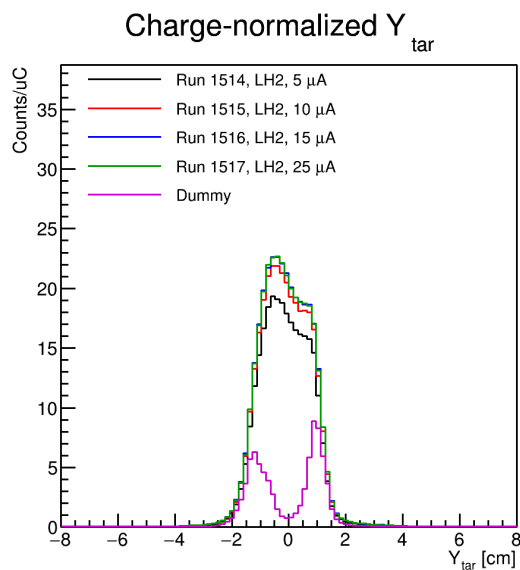
The dummy targets are aluminum foils mounted on separate frames with foils located at Z positions corresponding to the cryotarget exit and entrance windows.

[Certs for dummy target foils 0.05" and 0.032" thick | Jefferson Lab Electronic Logbook \(jlab.org\)](#)

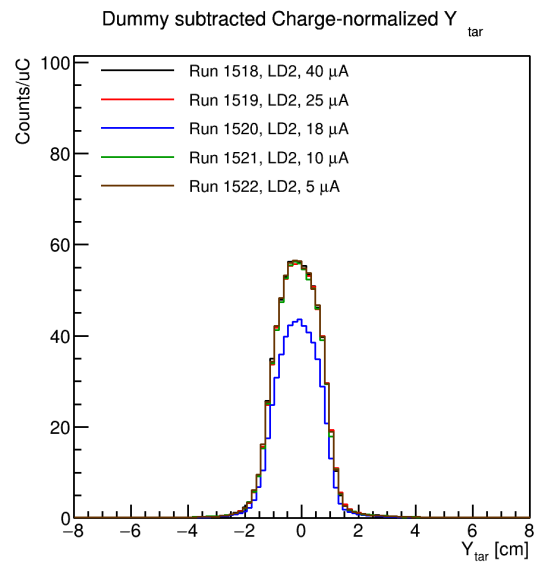
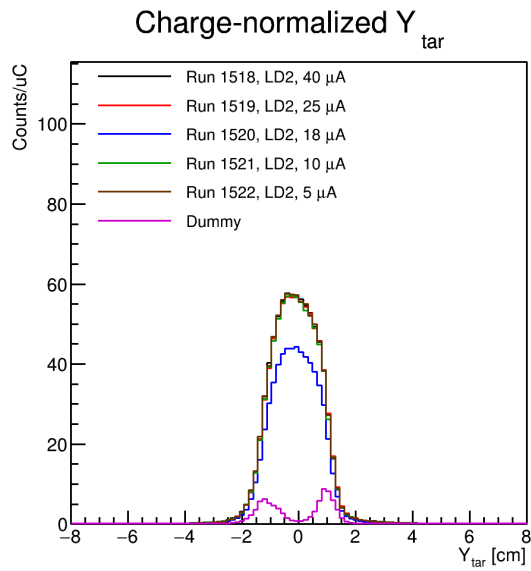
Target	Thickness Total (g/cm ²)	Material
10 cm Dummy Upstream	0.1703 ± 0.0002	Al 7075
10 cm Dummy Downstream	0.1677 ± 0.0002	Al 7075

Results

- LH2 Ytar



- LD2 Ytar



- No obvious differences show with different beam current for both target \rightarrow No boiling