AFE characterization

Antoine

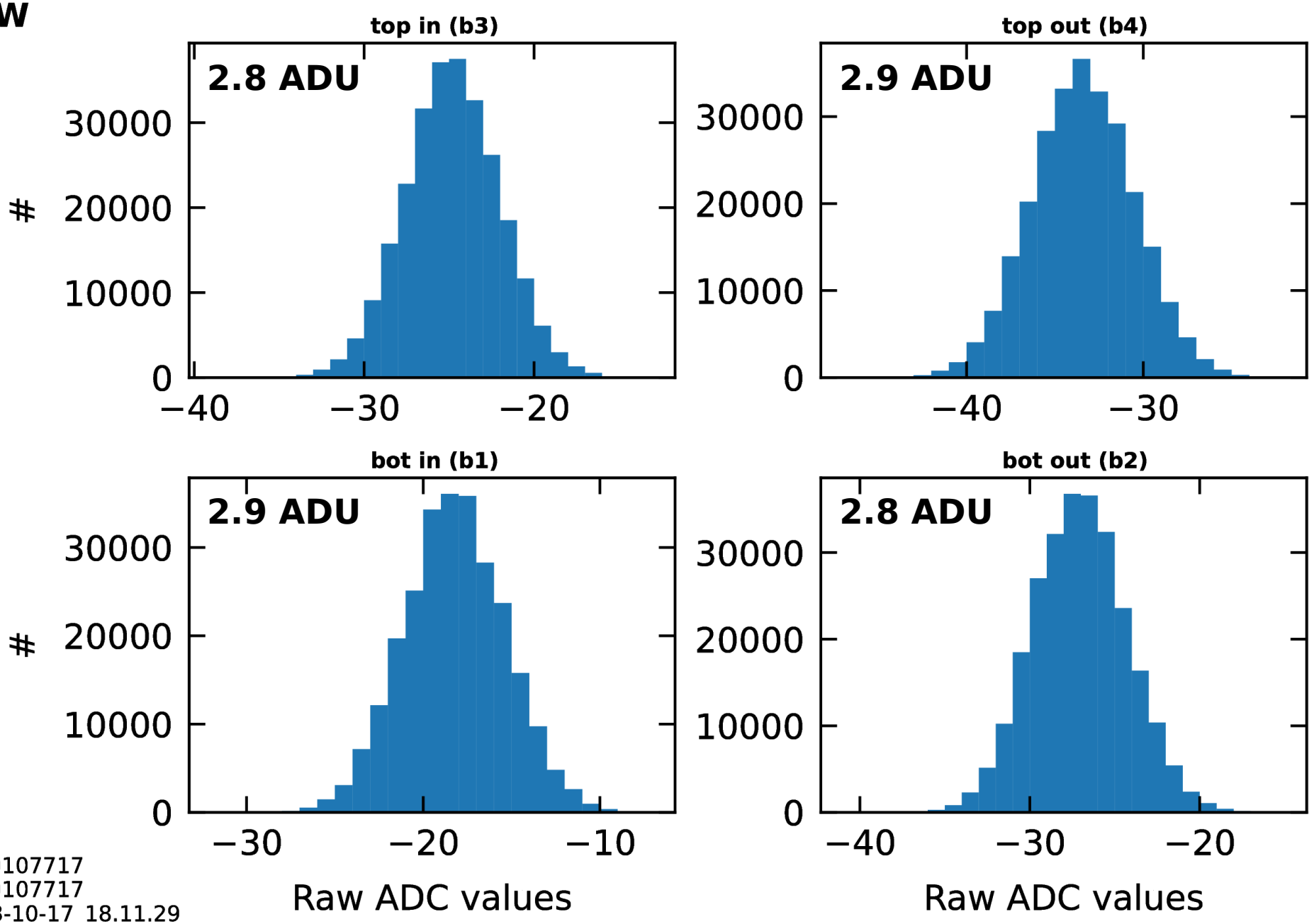
CBPM meeting: October 20, 2023

Setup

4 AFE cards with the same final-design configuration

RMS noise

12W

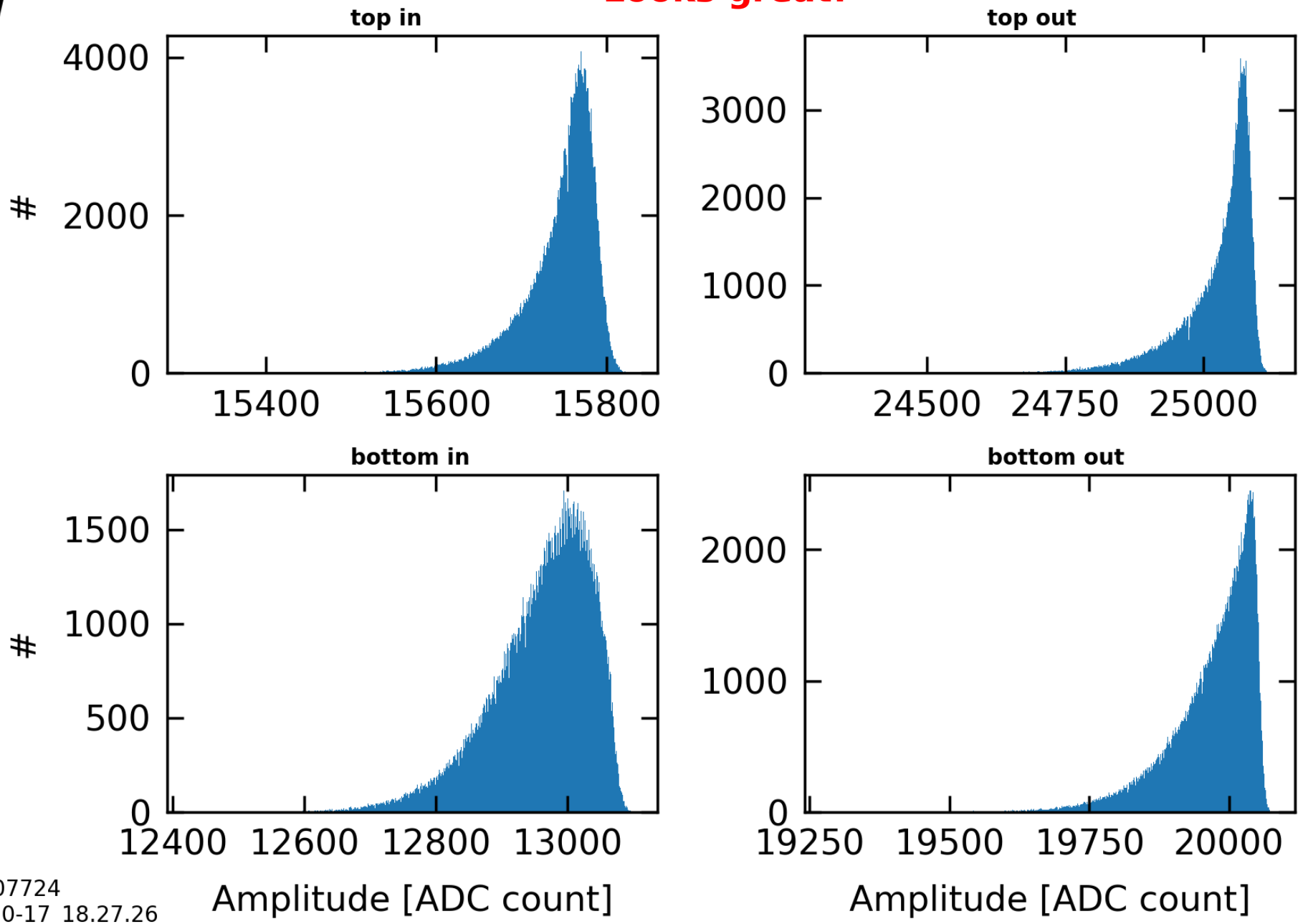


RD-0107717
RD-0107717
2023-10-17_18.11.29

Train 1 bunch 1 at 2.55 mA

12W

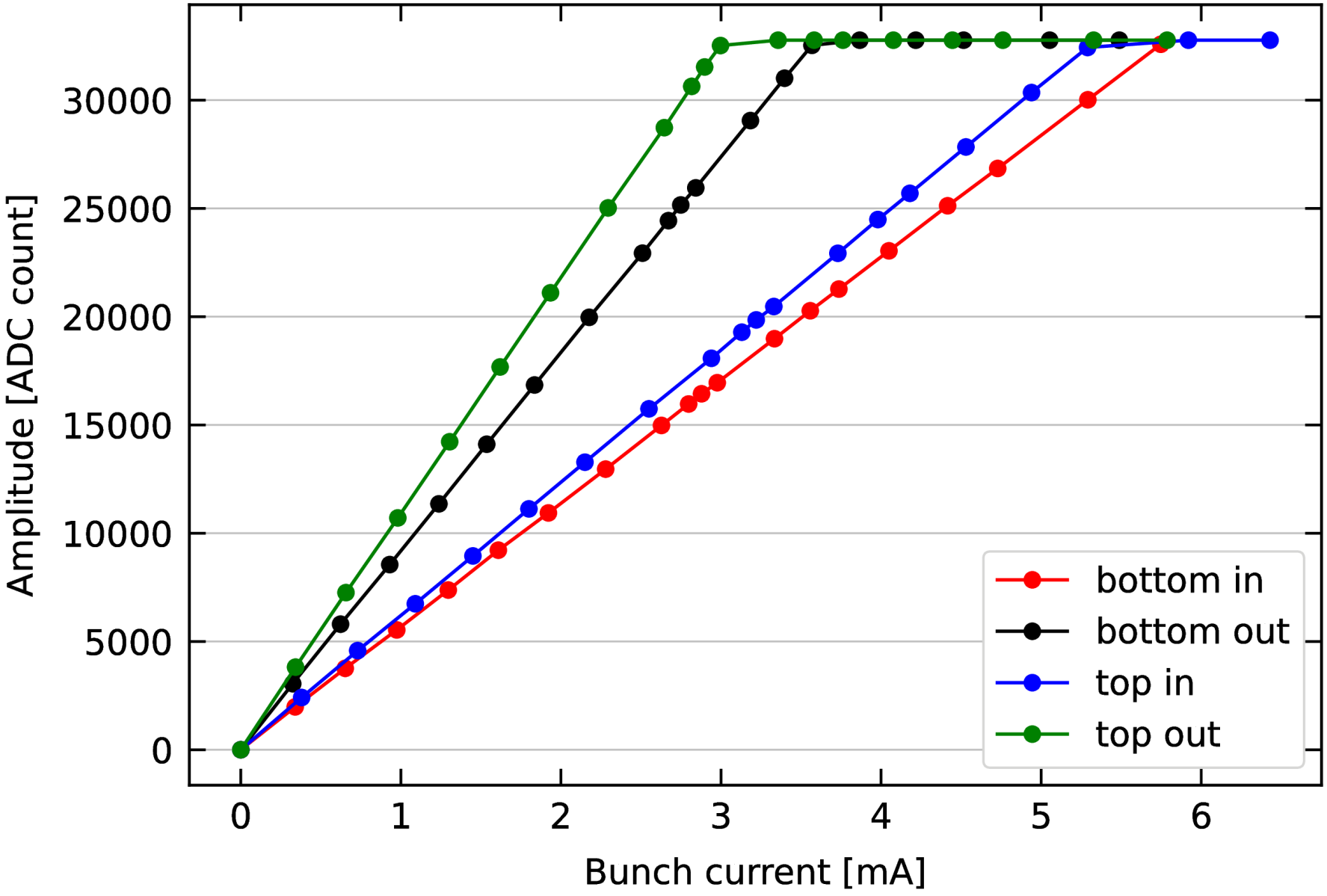
Looks great!



RD-0107724
2023-10-17_18.27.26

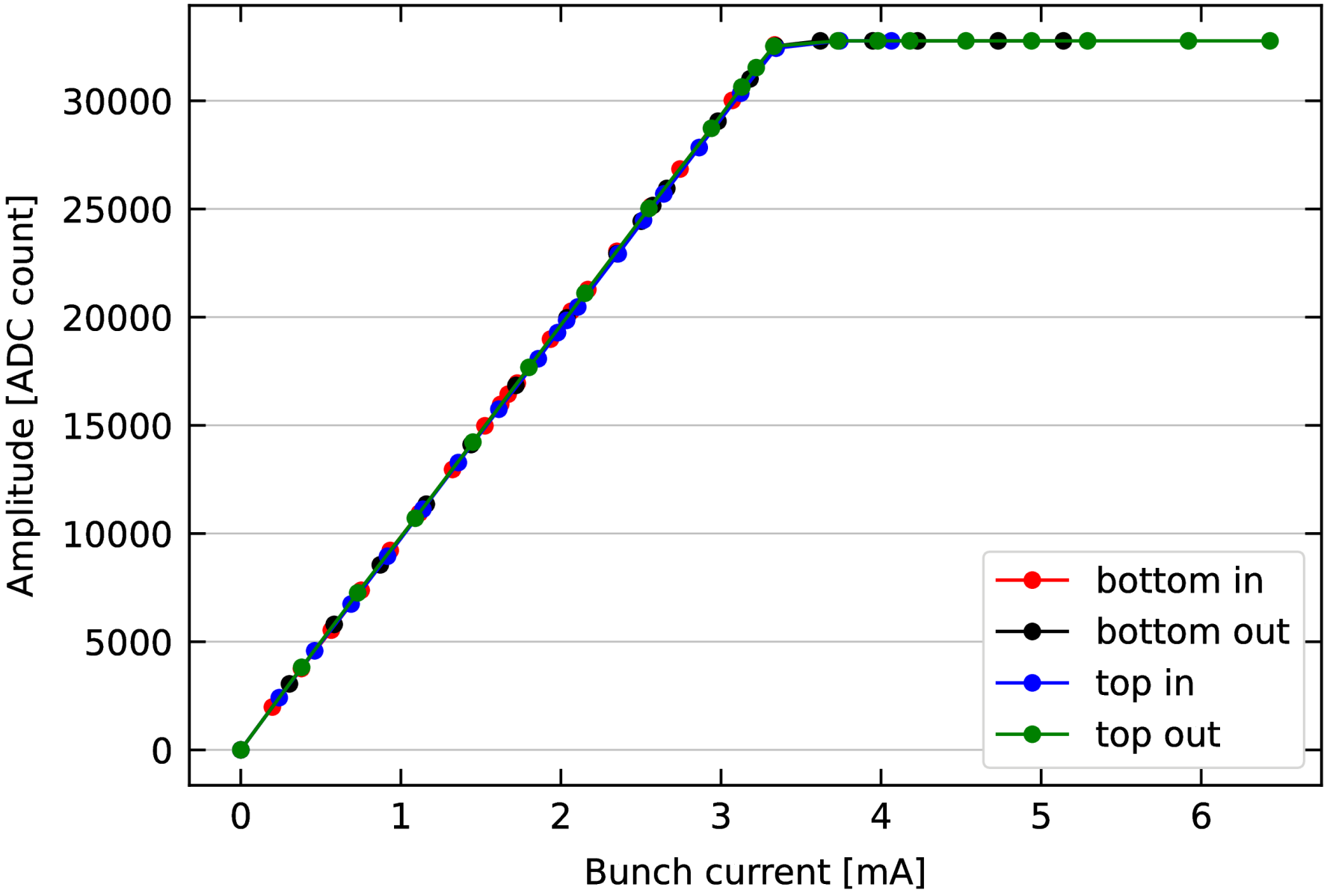
Amplitude vs bunch current

12W (ctactf133), peak-aligned at each current step – Tuesday **10/20**



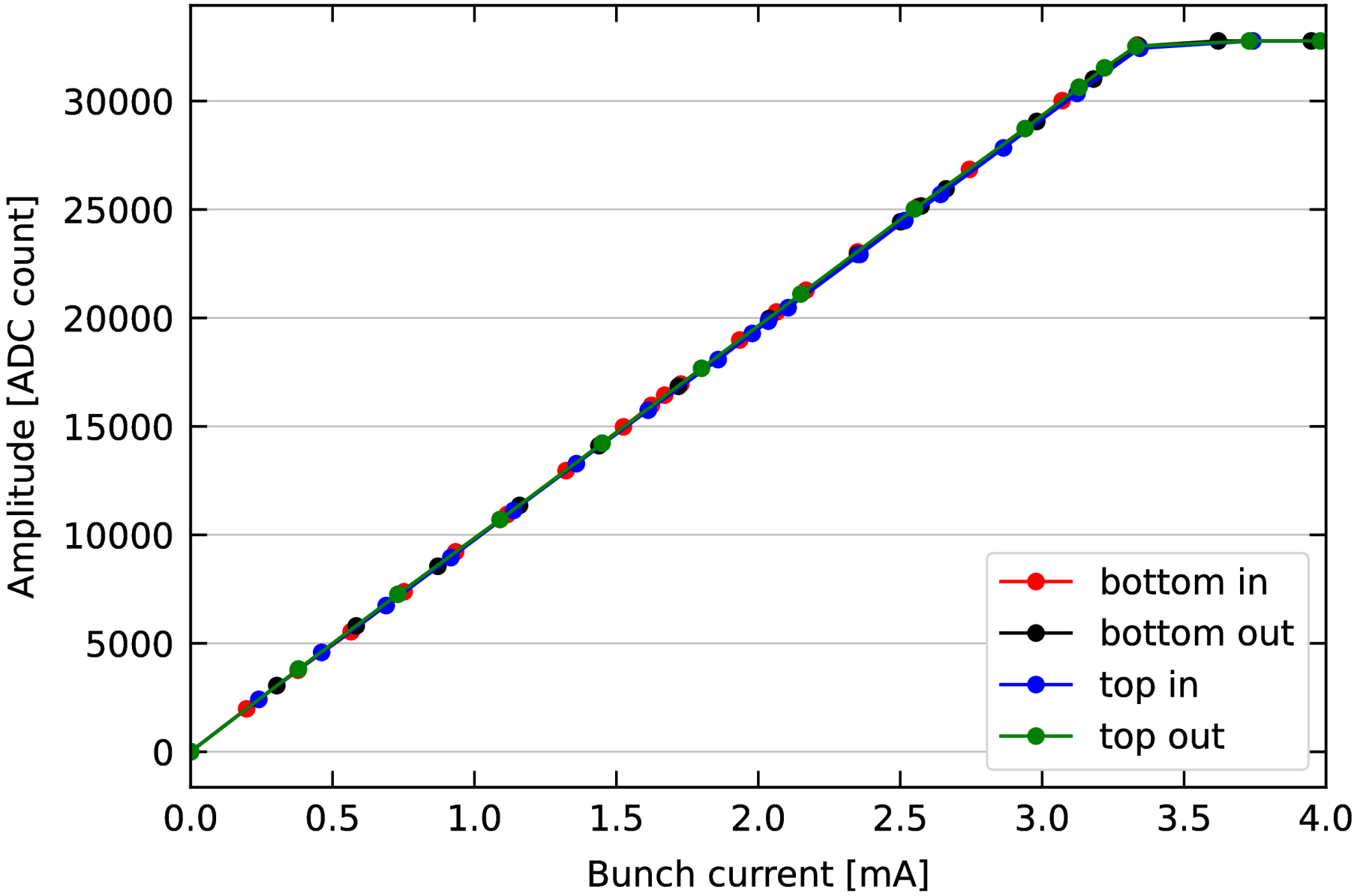
Amplitude vs bunch current

After scaling for the beam position difference at lowest current

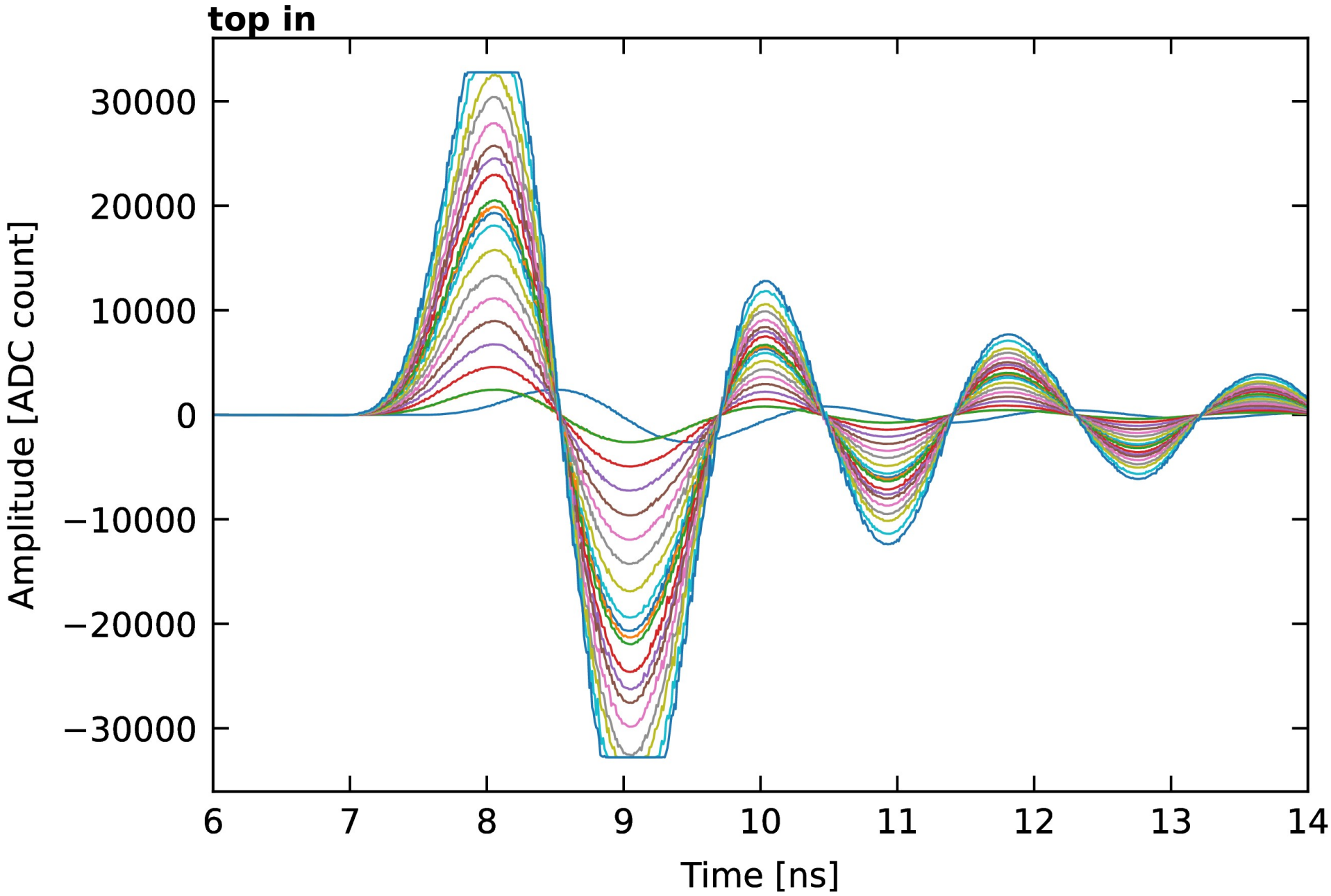


Amplitude vs bunch current

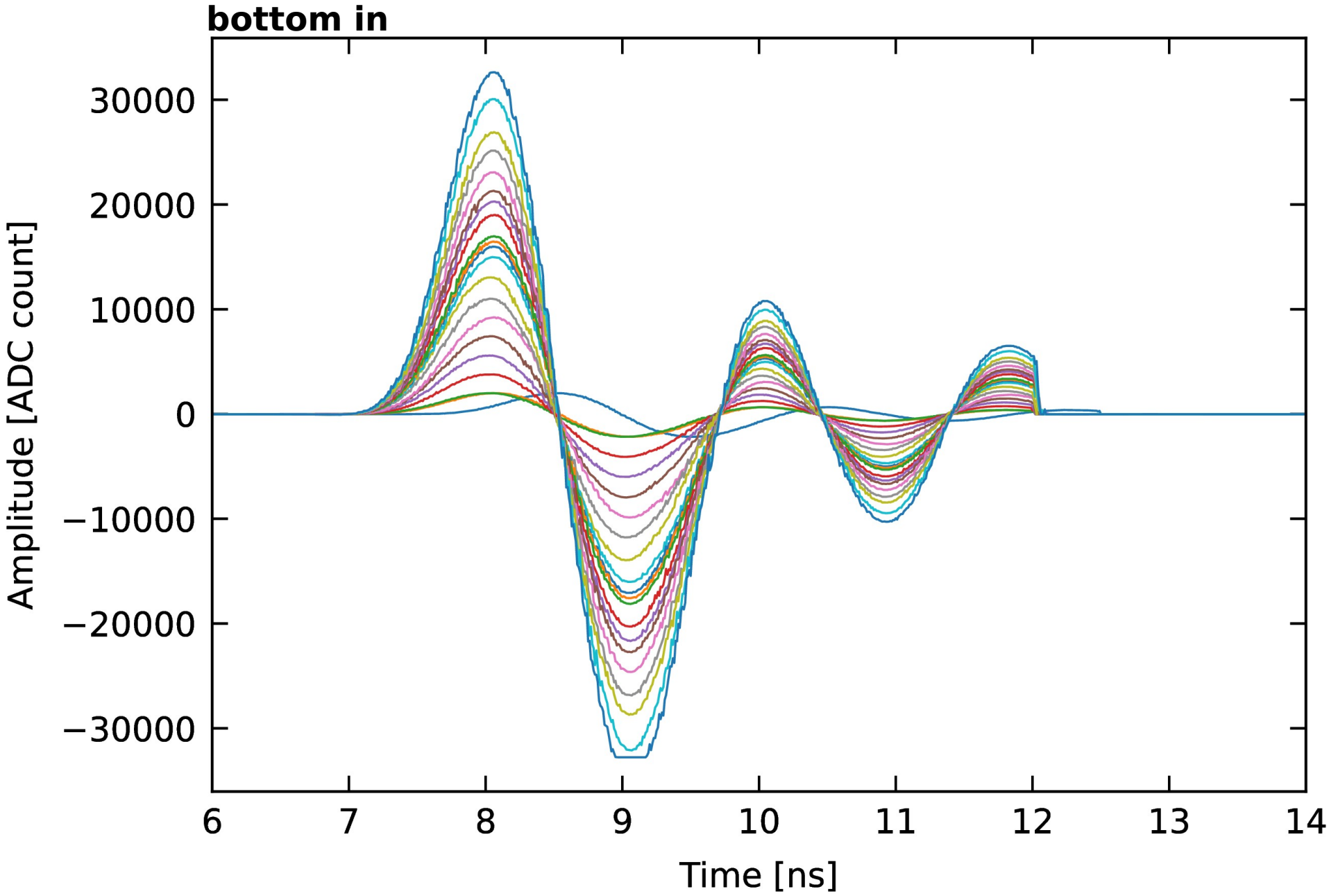
After scaling for the beam position difference at lowest current: zoom [0, 4] mA



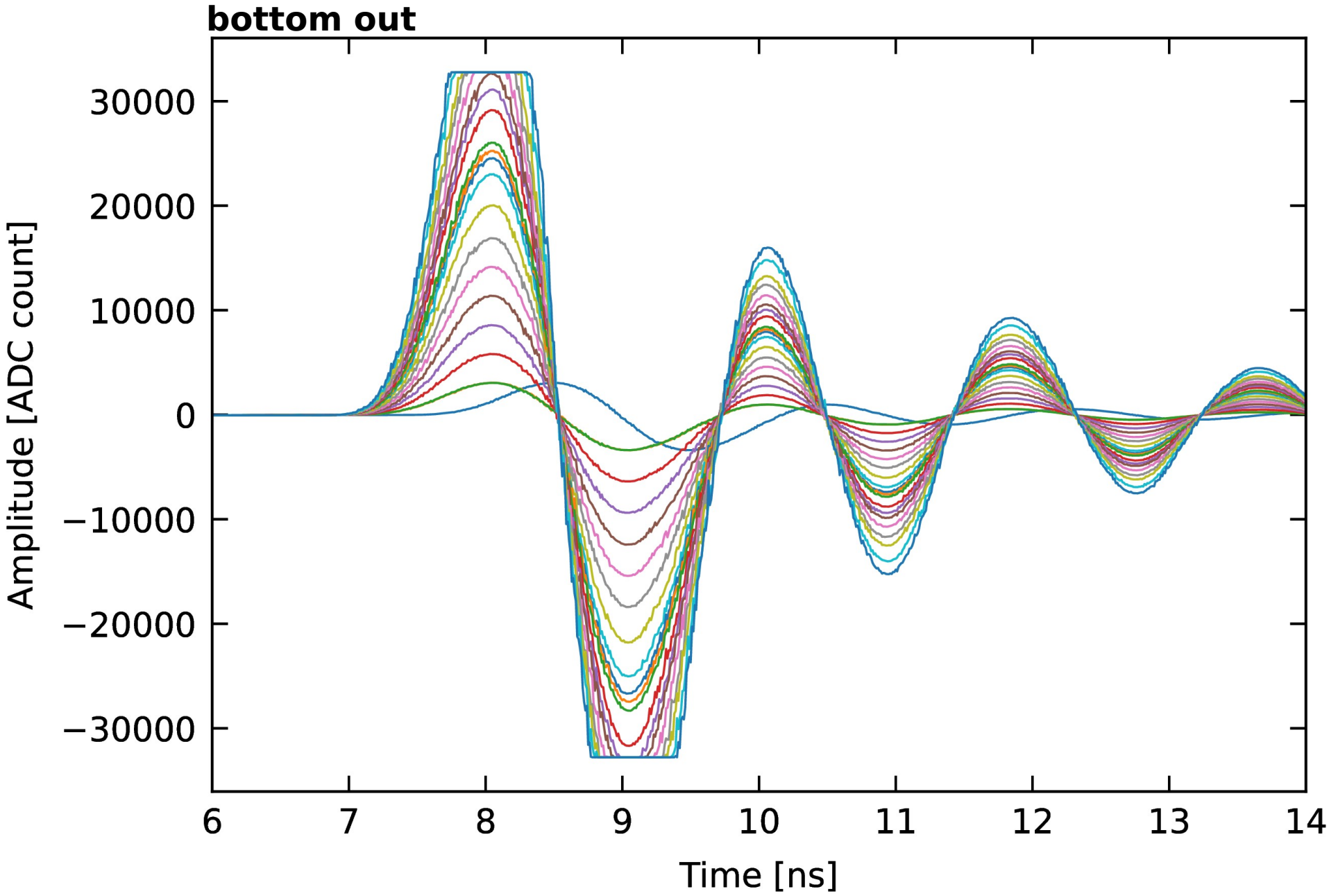
Waveform


top in
Amplitude [ADC count]
30000
20000
10000
0
−10000
−20000
−30000
6
7
8
9
10
11
12
13
14
Time [ns]

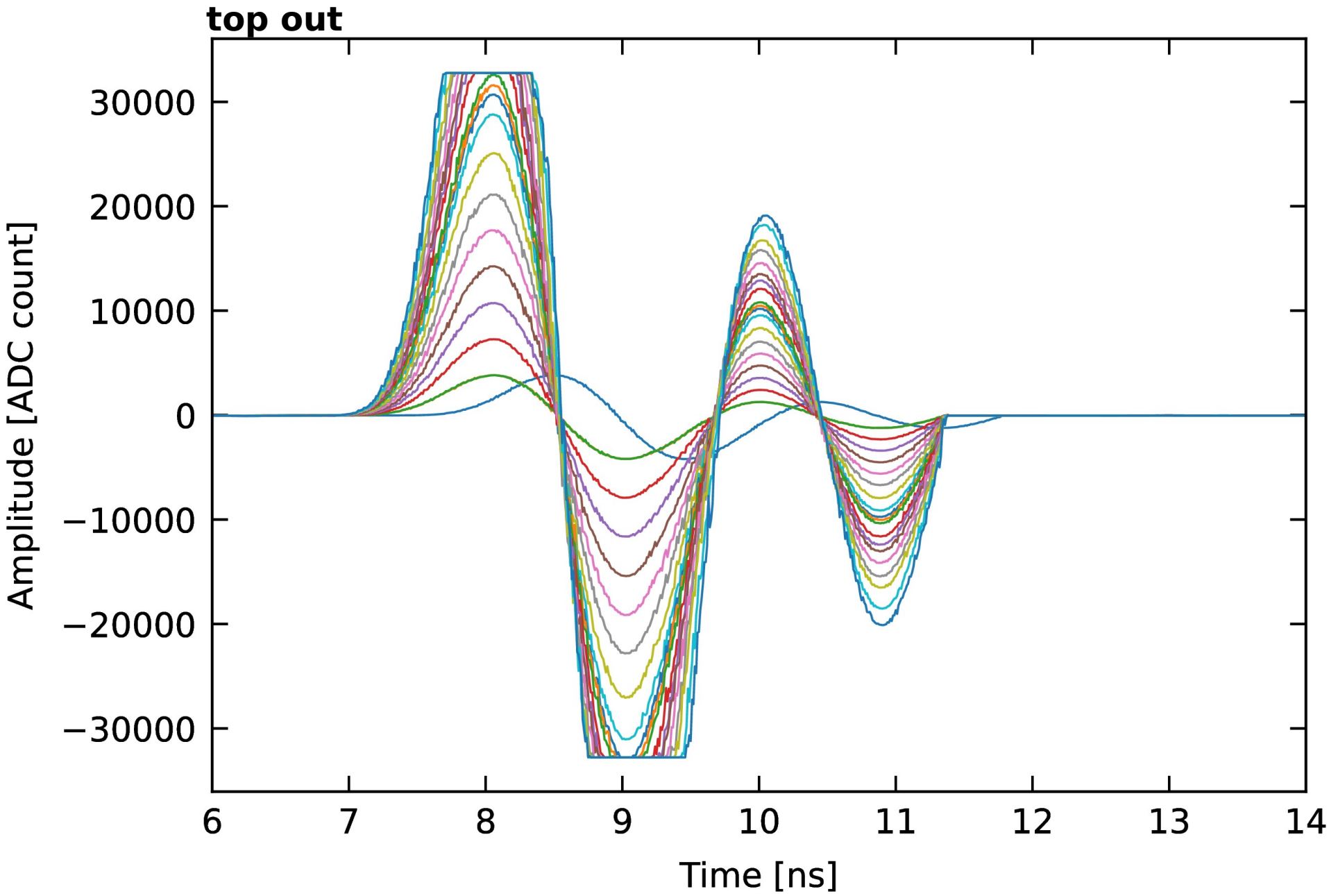
Waveform


bottom in
30000
20000
10000
0
−10000
−20000
−30000
Amplitude [ADC count]
6
7
8
9
10
11
12
13
14
Time [ns]

Waveform


bottom out
Amplitude [ADC count]
30000
20000
10000
0
−10000
−20000
−30000
6
7
8
9
10
11
12
13
14
Time [ns]

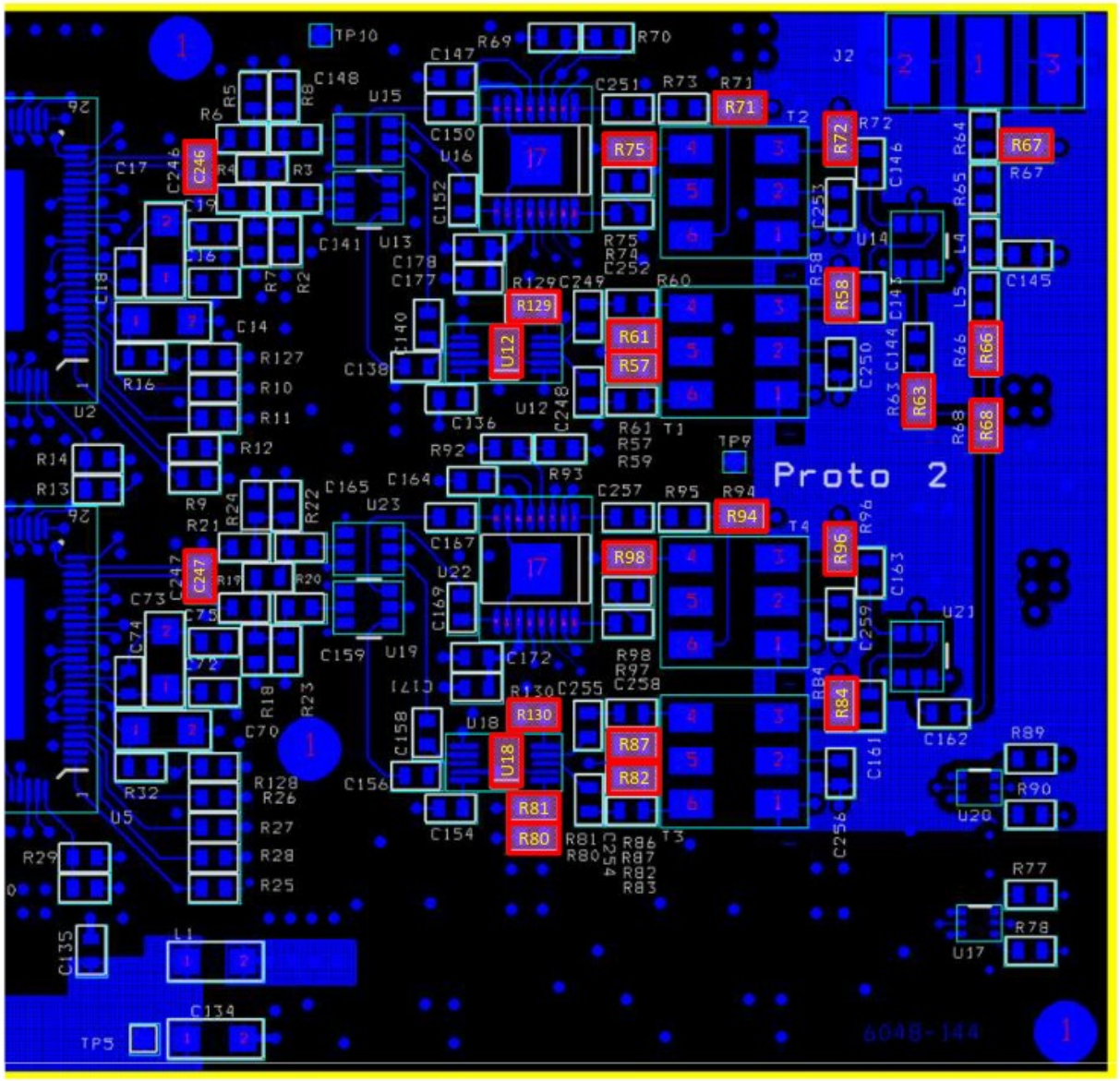
Waveform


top out
Amplitude [ADC count]
30000
20000
10000
0
−10000
−20000
−30000
6
7
8
9
10
11
12
13
14
Time [ns]

Additional materials

Final design

REVISIONS FOR AFE 6048-145 – TOP SIDE



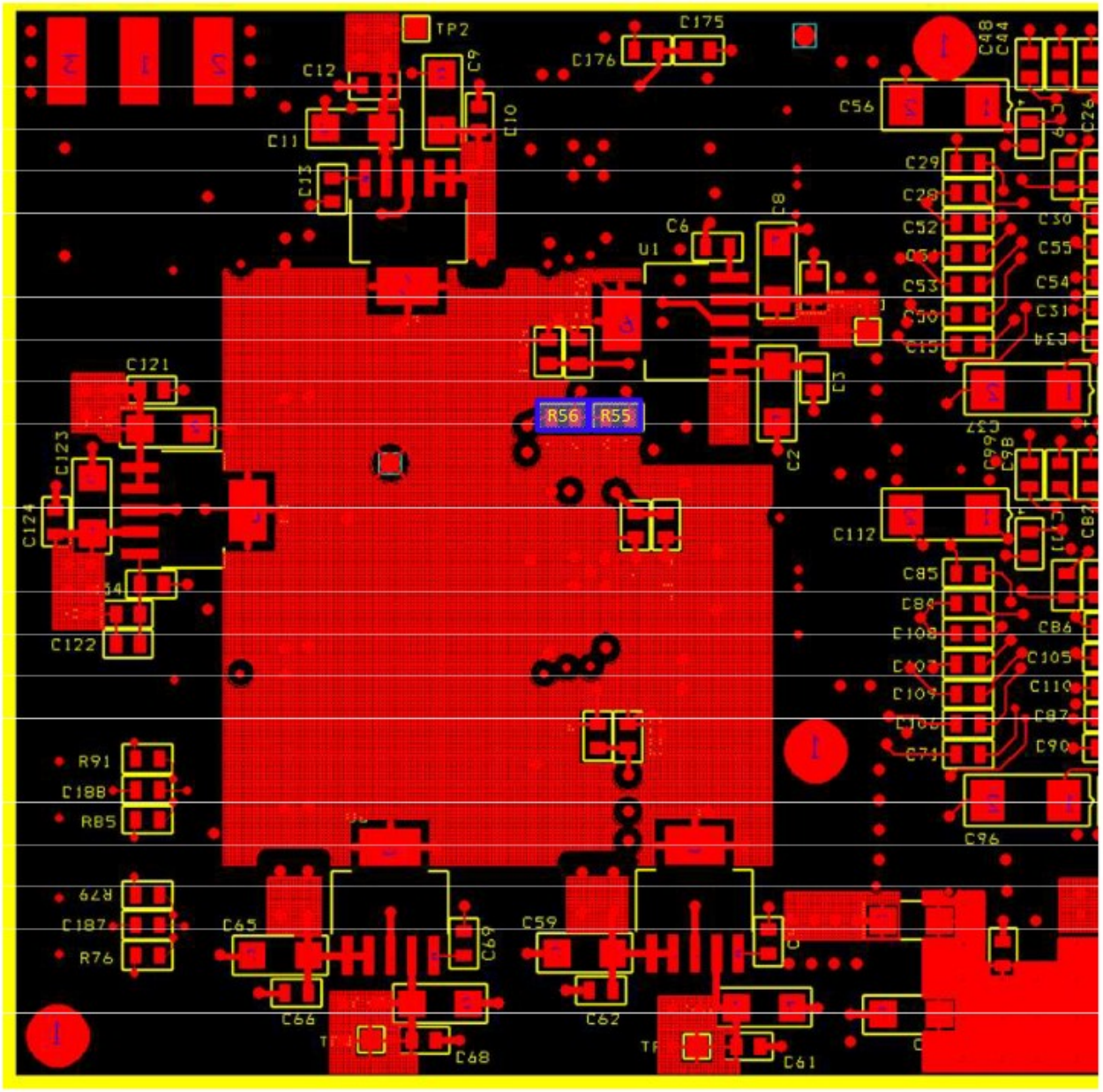
R67: REMOVE 49.9Ω → DO NOT POPULATE (DNP)
R63,66,68: REMOVE 16.9Ω → PUT IN 0Ω
R58,84: REMOVE 49.9Ω → PUT IN 100Ω
R72,96: REMOVE 49.9Ω → DNP
R71,75,94,98: REMOVE 33Ω → PUT IN 100Ω
R57,61,82,97: REMOVE DNP → PUT IN 2.49KΩ
R80: REMOVE 1KΩ → DNP
R129,130: REMOVE 10Ω → PUT IN 1KΩ
R81: REMOVE DNP → PUT IN 1KΩ

U12, 18: REMOVE AD8351 → PUT IN DIODE PCB ASSY

C246,247: REMOVE 10pF → DNP

Final design

REVISIONS FOR AFE 6048-145 – BOTTOM SIDE



R55: REMOVE 1KΩ → DO NOT POPULATE

R56: NOT POPULATE → PUT IN 1KΩ