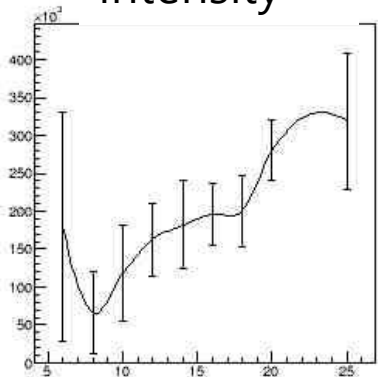# Weekly report
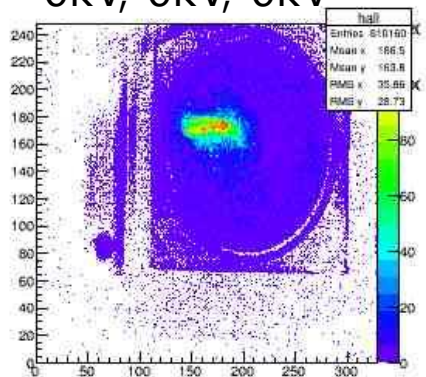
SNU

BongHo Kim
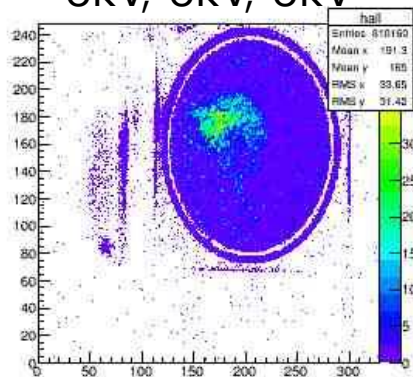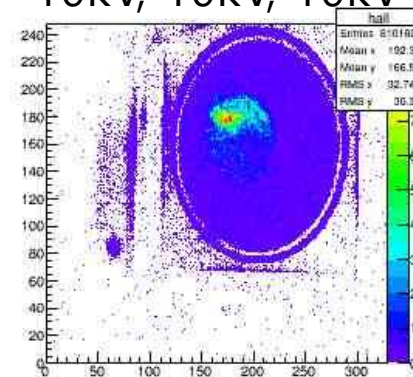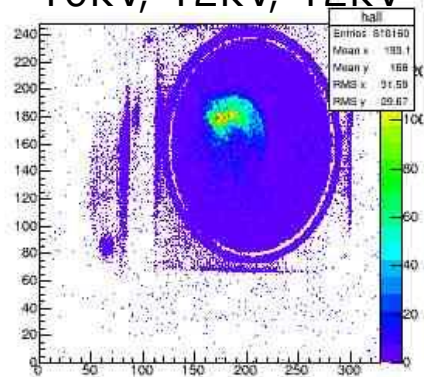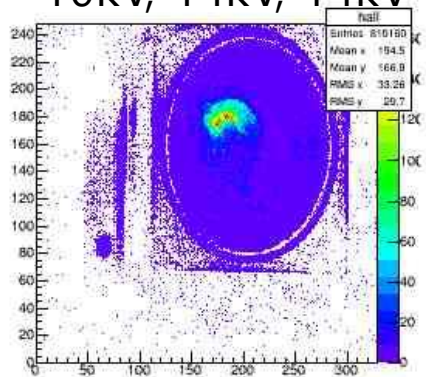
Intensity

6kV, 6kV, 6kV

8kV, 8kV, 8kV

10kV, 10kV, 10kV

Last week
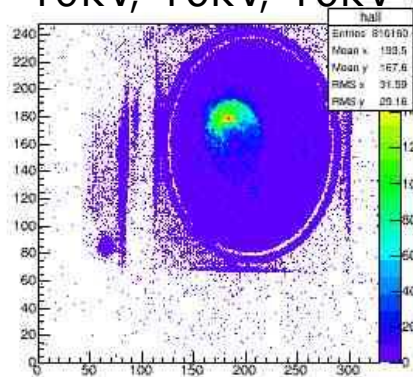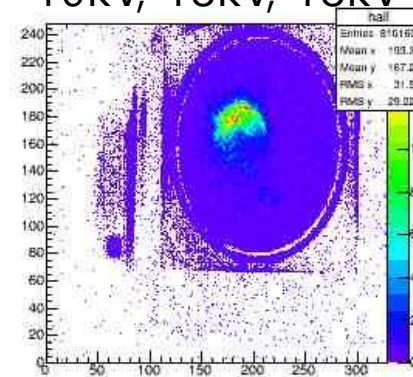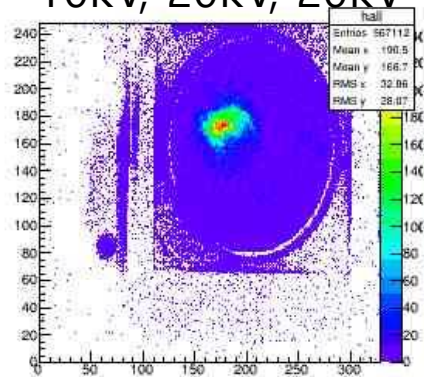
10kV, 12kV, 12kV

10kV, 14kV, 14kV

10kV, 16kV, 16kV

10kV, 18kV, 18kV

10kV, 20kV, 20kV

10kV, 20kV, 25kV
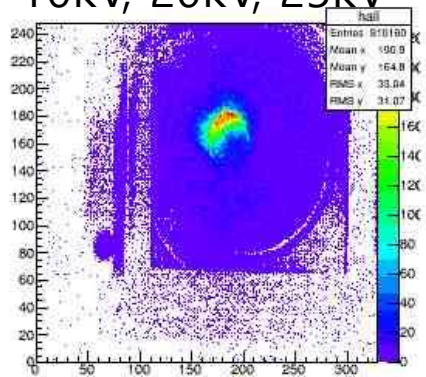
- Each pictures are averaged by 10 pictures
- Last Coil with 20A
- As HV in lens is increased, intensity is increased and beam size become smaller
- Each picture has different scale for color but intensity in beam center is increased.

e+ beam line (near Antion chamber)
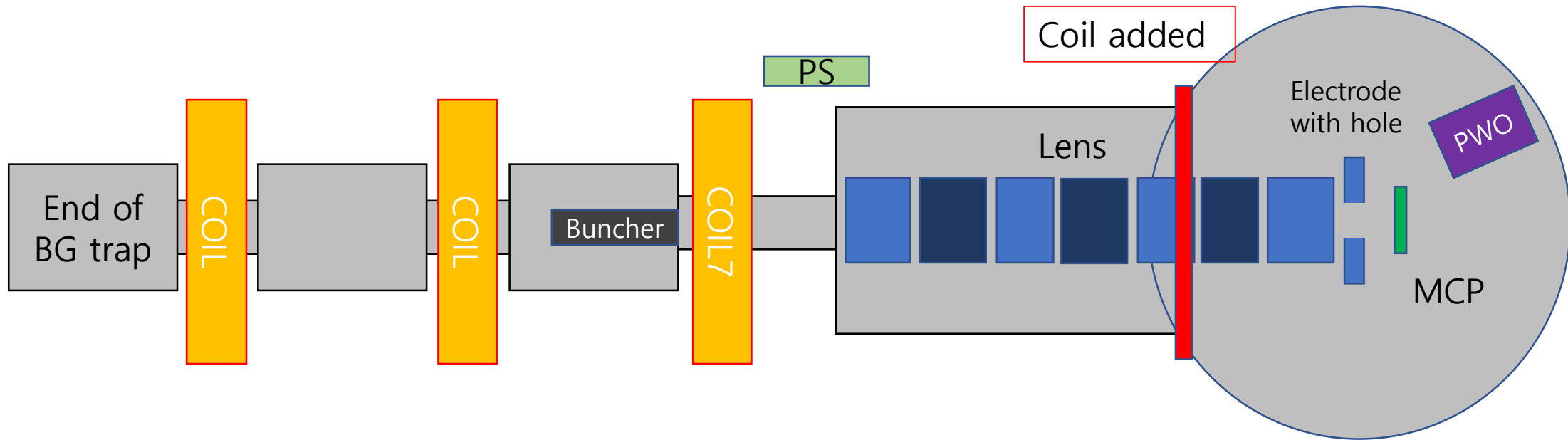
- Wire shielding cover is melted again with a few hour operation by 40A, 5V.
- Wire is changed and 1.5times coiling (18 turn).
- Test list : delay time, lens HV level, new coil current…

New coil test

10kV,20kV, 20kV lens
Coil7(20A), Coil(40A(~12turn))

0A (~19turn)
Highest pixel : 56

7A (~19turn)
Highest pixel : 67.8

15A (~19turn)
Highest pixel : 117

25A (~19turn)
Highest pixel : 100.9
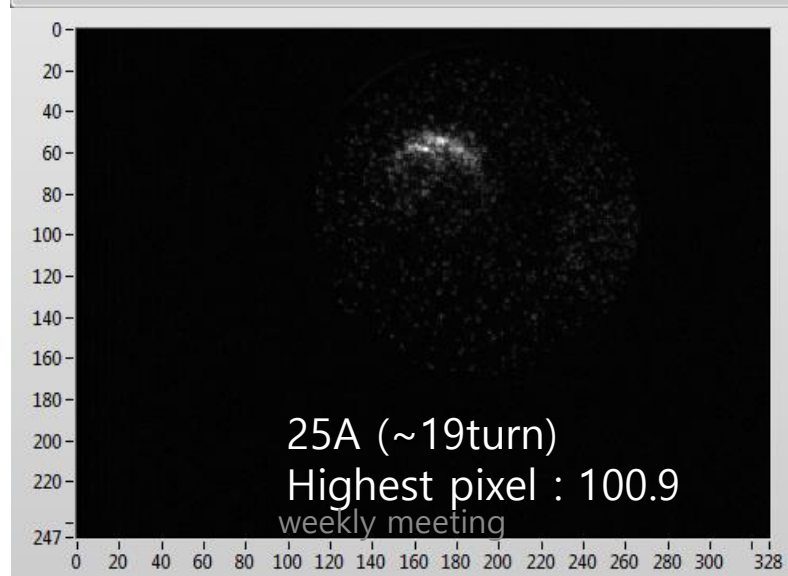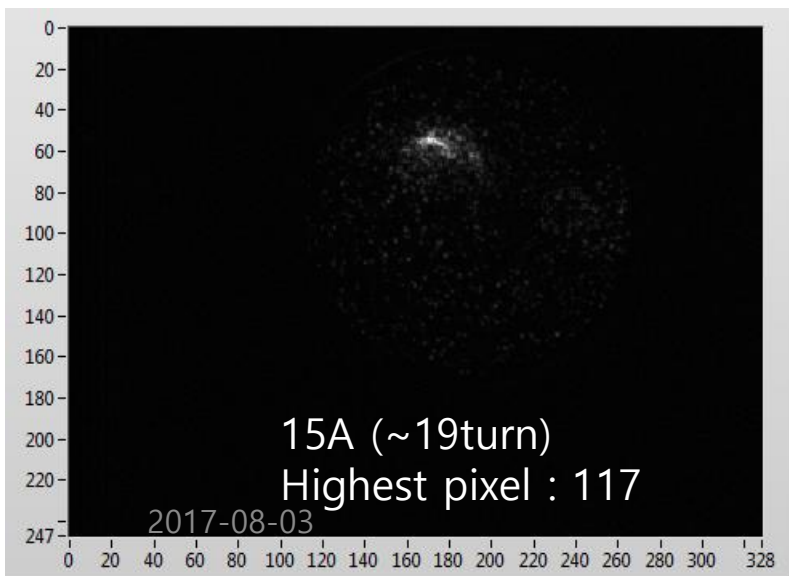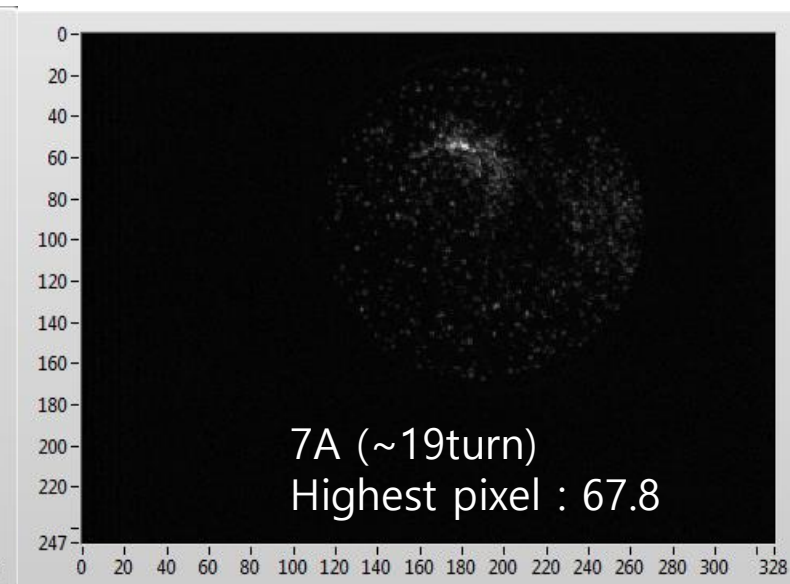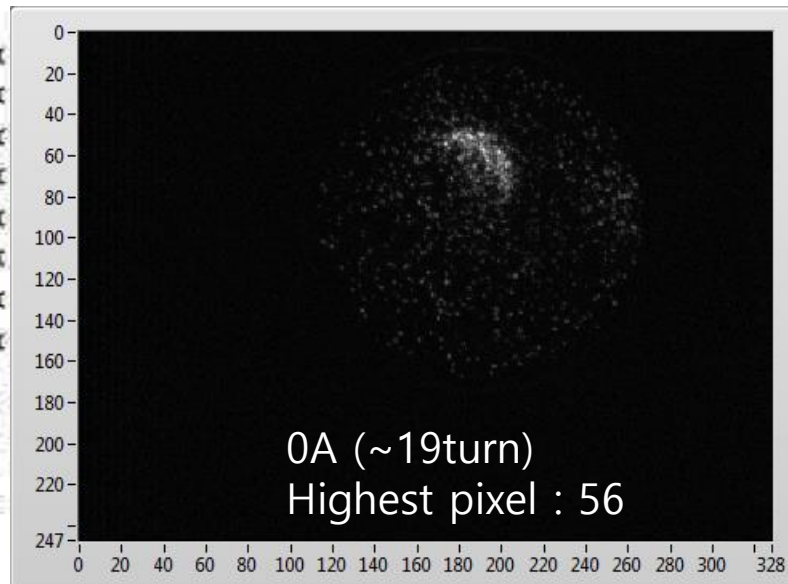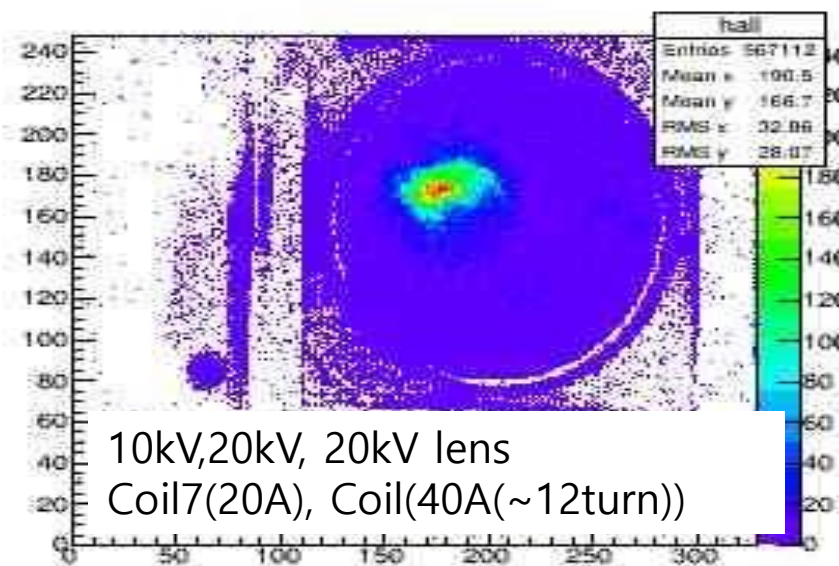
- New coil shows similar behavior with last coil.

Beam profile with different delay time

Condition : Lens (15kV, 10kV, 25kV) coil7(20A), coil(0A)

Delay time : 20ns
Highest pixel : 162.9

Delay time : 30ns
Highest pixel : 192.7

Delay time : 35ns
Highest pixel : 181.7

Delay time : 40ns
Highest pixel : 202.9

Delay time : 50ns
Highest pixel : 230.2
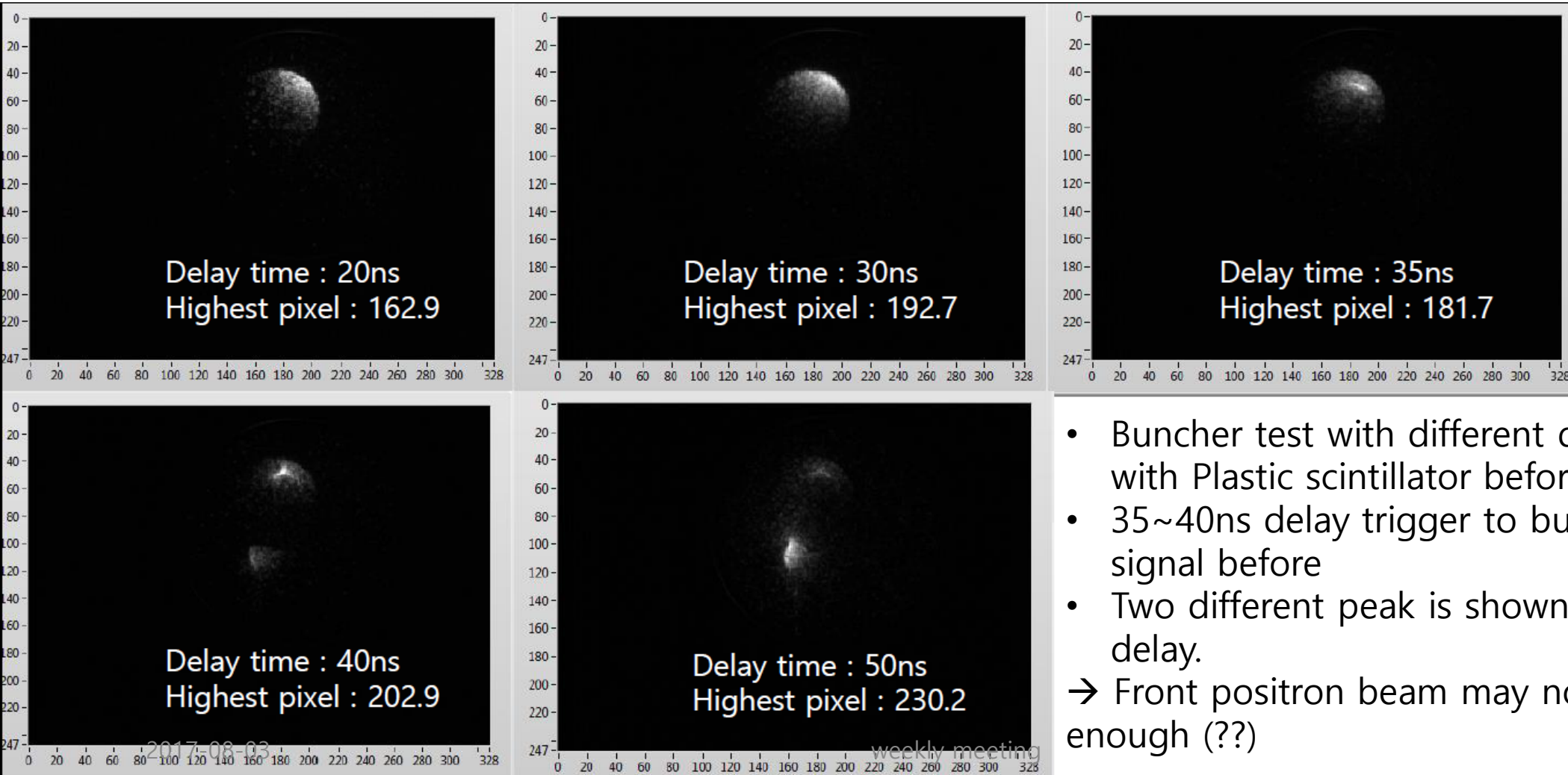
- Buncher test with different delay time was done with Plastic scintillator before.
- 35~40ns delay trigger to buncher showed best signal before
- Two different peak is shown for above 40ns delay.
→ Front positron beam may not be accelerated enough (??)

Beam profile with changing coil7

Coil7 : 0A
Highest pixel : 459.4

Coil7 : 7A
Highest pixel : 410.6

Coil7 : 15A
Highest pixel : 371

Coil7 : 20A
Highest pixel : 133.3
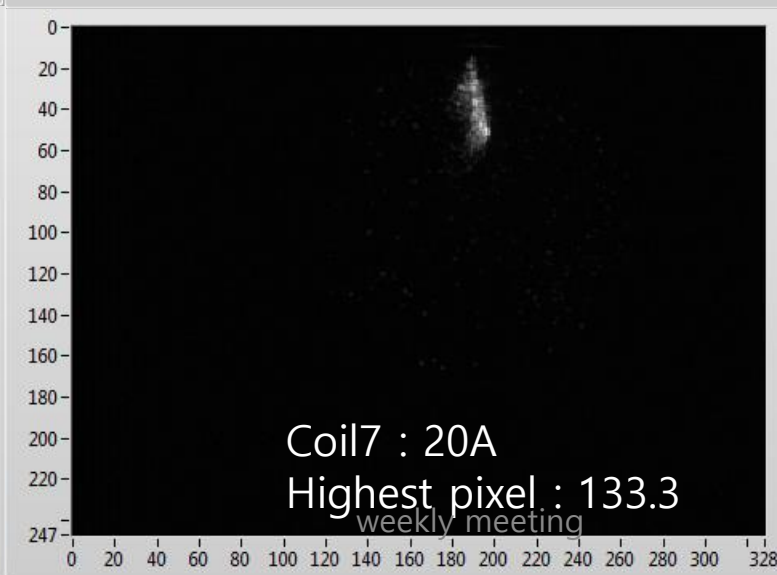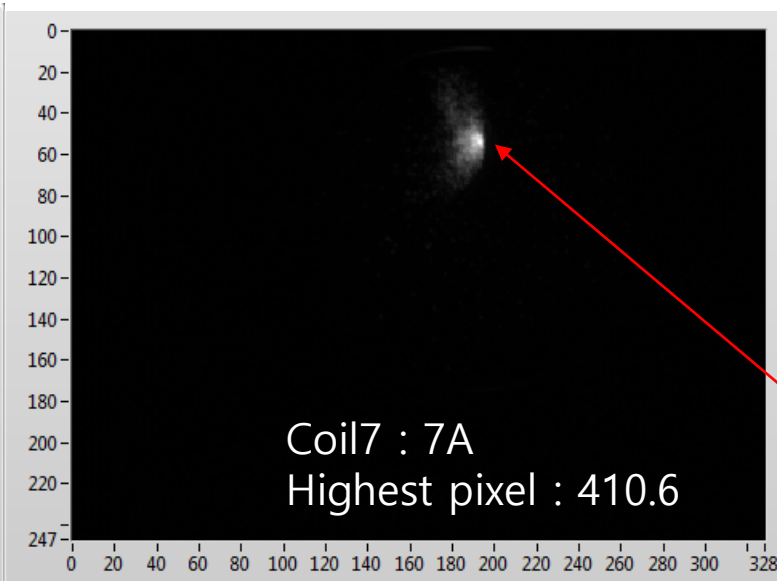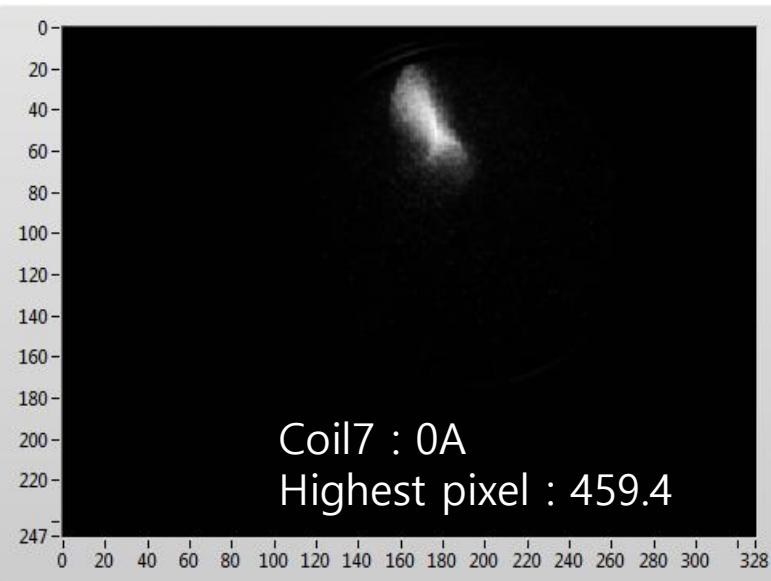
- Condition : Lens (17, 0, 25kV), coil(0A)

- Low current for Coil7 shows better intensity.
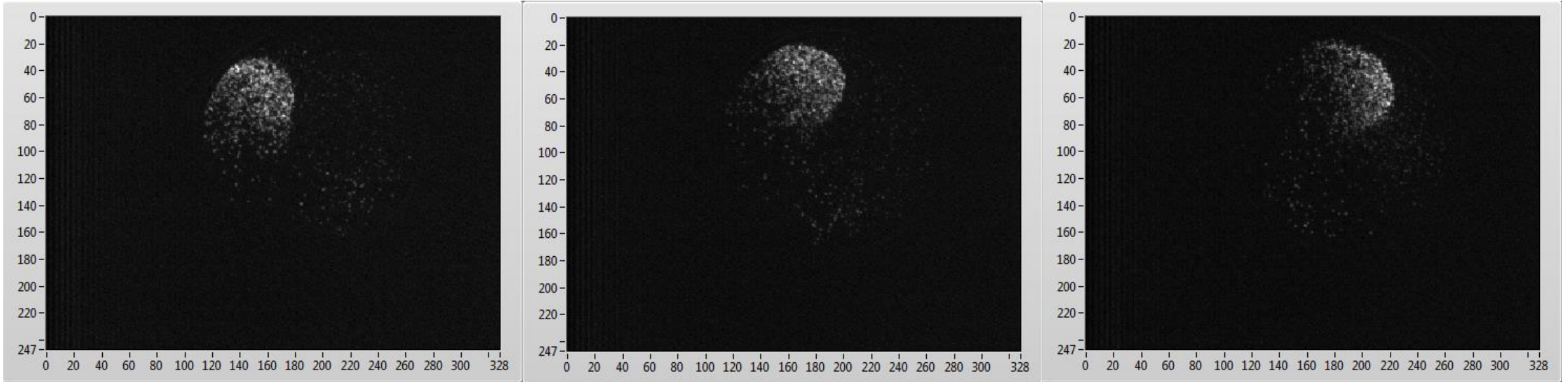
- When coil7 has current, we can see that beam is blocked by some thing.

- From expectation by Amelia, beam size should be larger in the buncher when B field in coil7 is decreased.
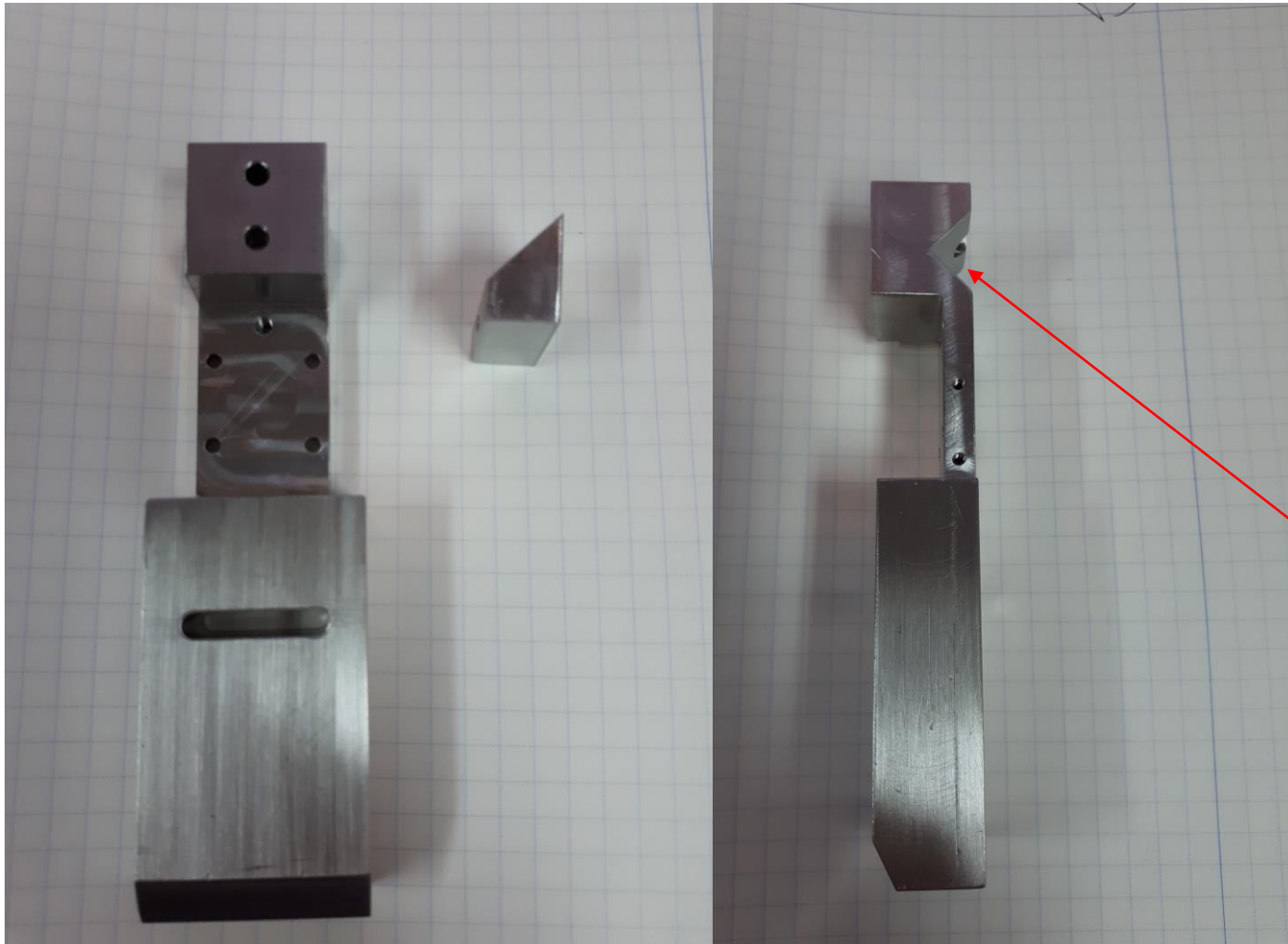
Why? → one possibility is that only part of beam can go through the buncher.
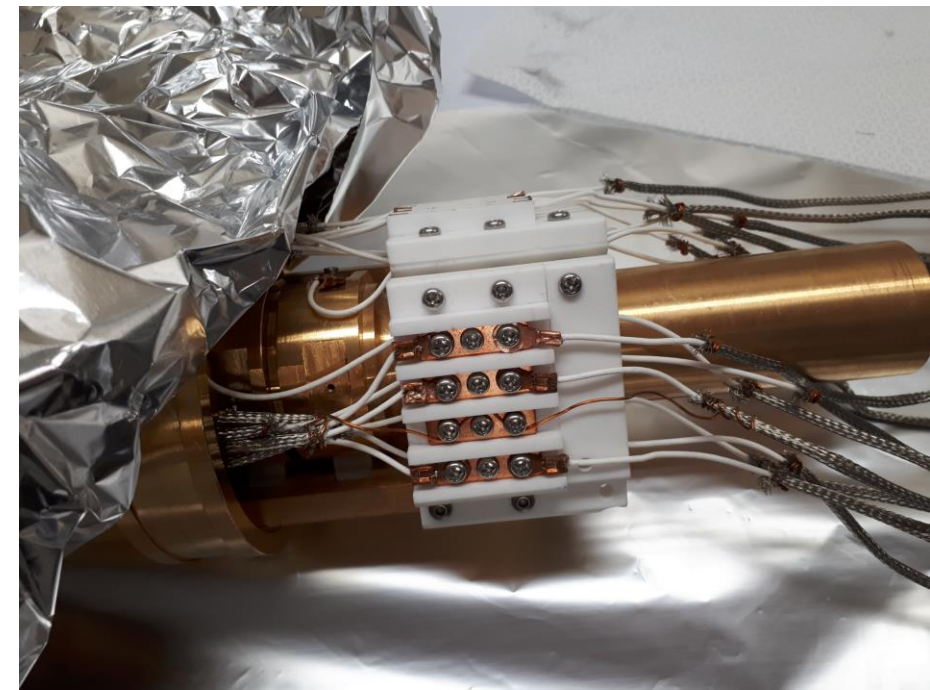
Additional

- From the left, coil current is 20A,0,-20A.
- Coil direction is opposite to beam direction.

Test condition : (0,0,25kV), coil7(0A), buncher(3kV)

Status in CEA

- Left picture shows positronium target holder
- Total four kind of target will be installed
- W block can be installed backside of target

- Upper right picture shows cable connection in Riken trap electrode.
  (Just for information)

To do list

- Coil7 direction will be adjusted to align coil7 and buncher.
- Positron energy and decay gamma energy will be measured.
- Positron intensity will be estimated by PWO detector.
- TOF simulation study. (lxplus usage is okay now)
- S-particle study.