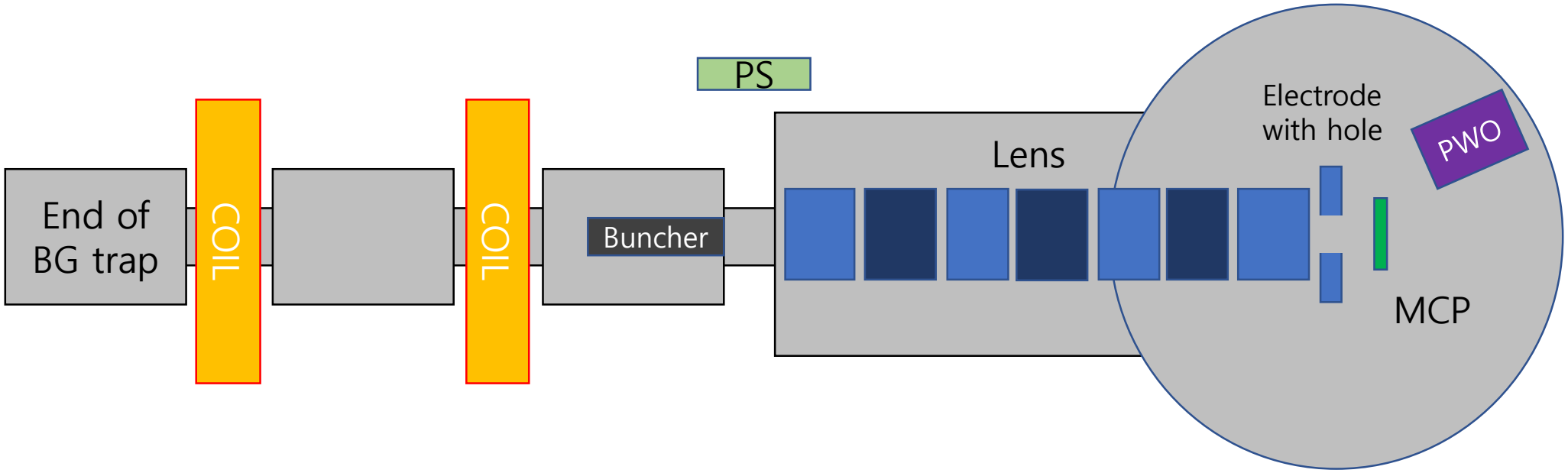
Positronium intensity measurement preparation (GBAR)

SNU

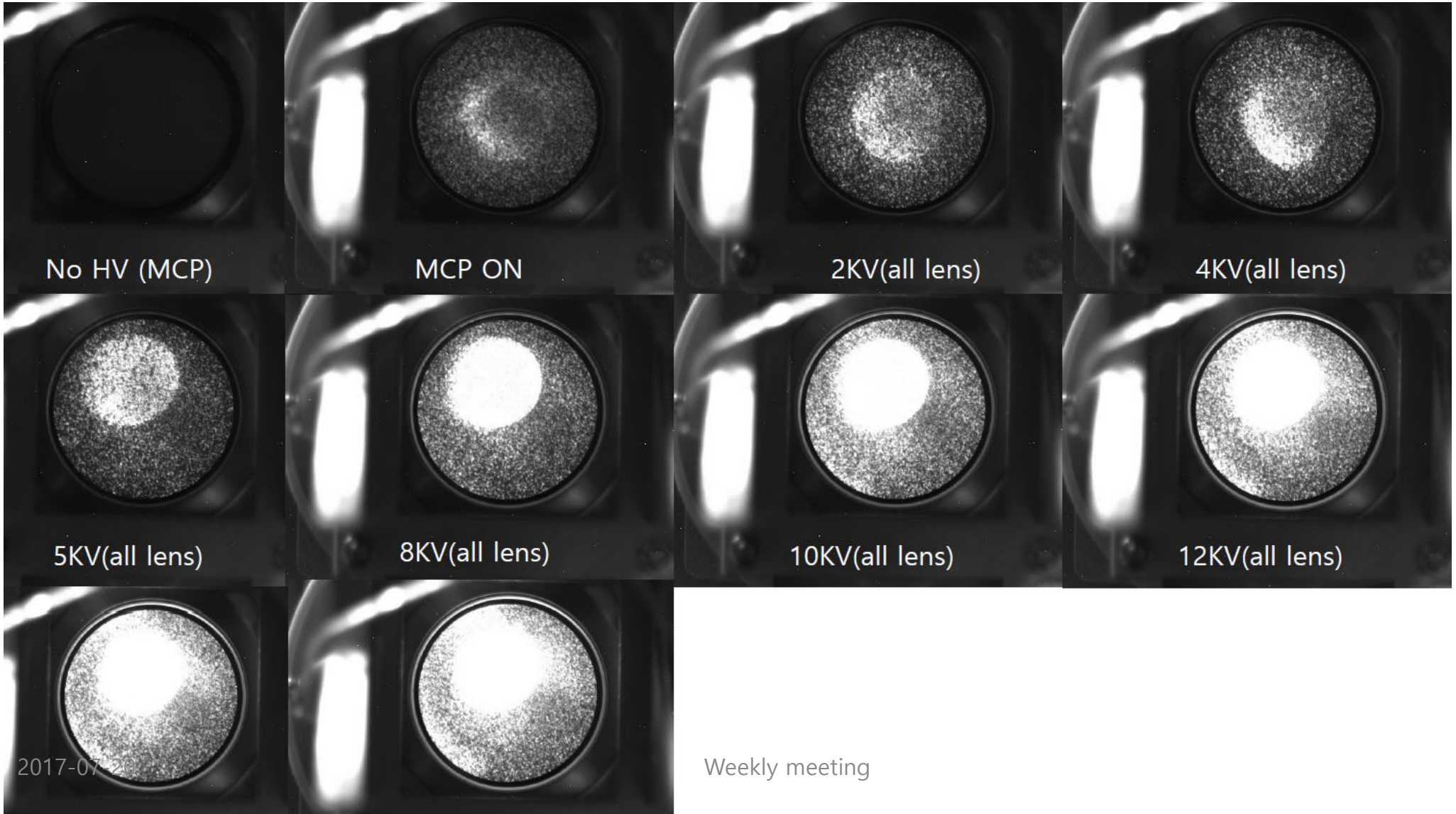
Bongho Kim

e+ beam line (near antion chamber)

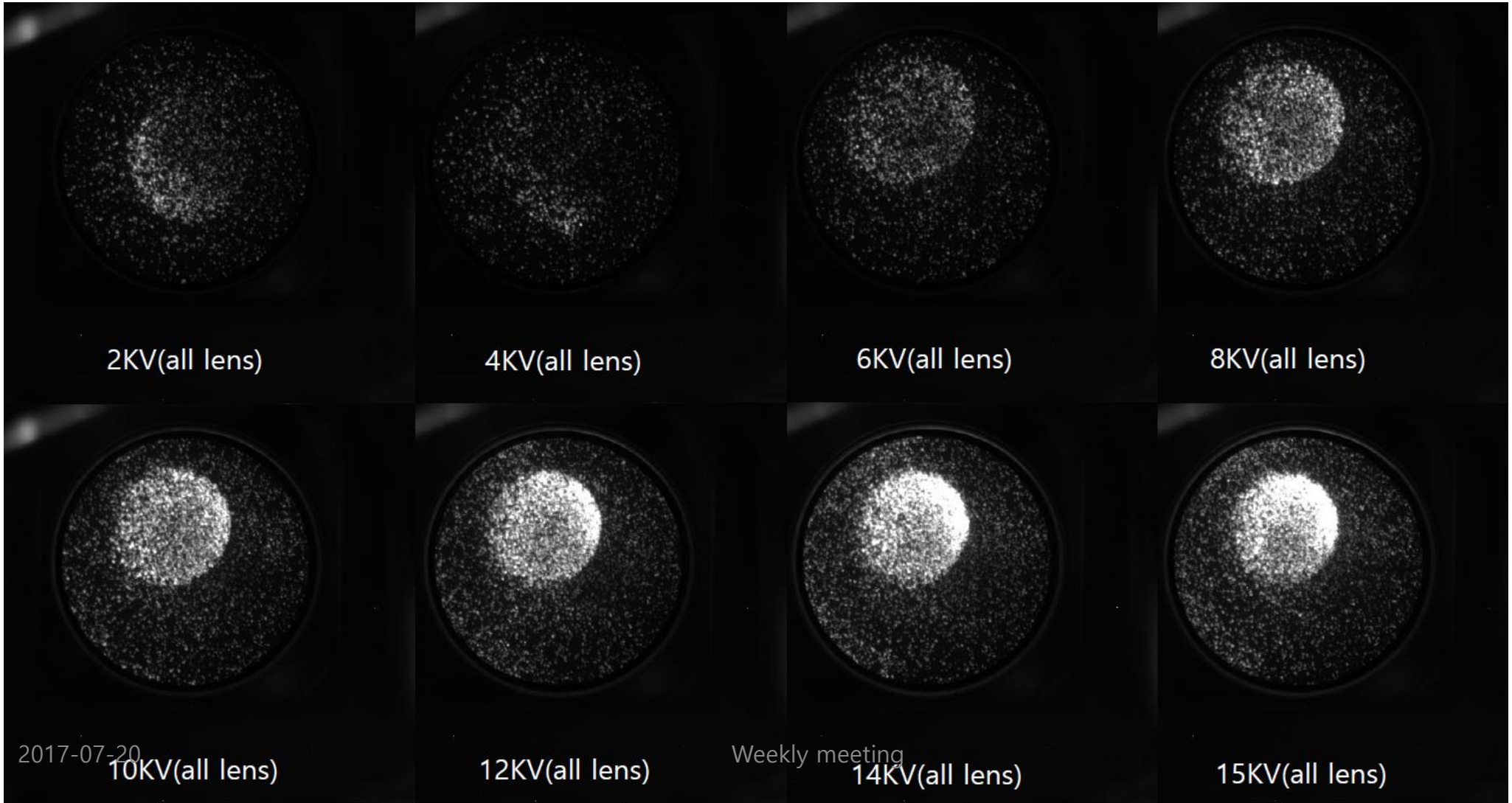


- Buncher is used for beam acceleration (~4.5kV)
- Lens is used for focusing by positive HV below 30kV by three lens
- MCP is installed with grid (front of MCP) to monitor beam profile and for energy scan
- Time distribution is tested with new switch in the end of BG trap (switch for beam dump)

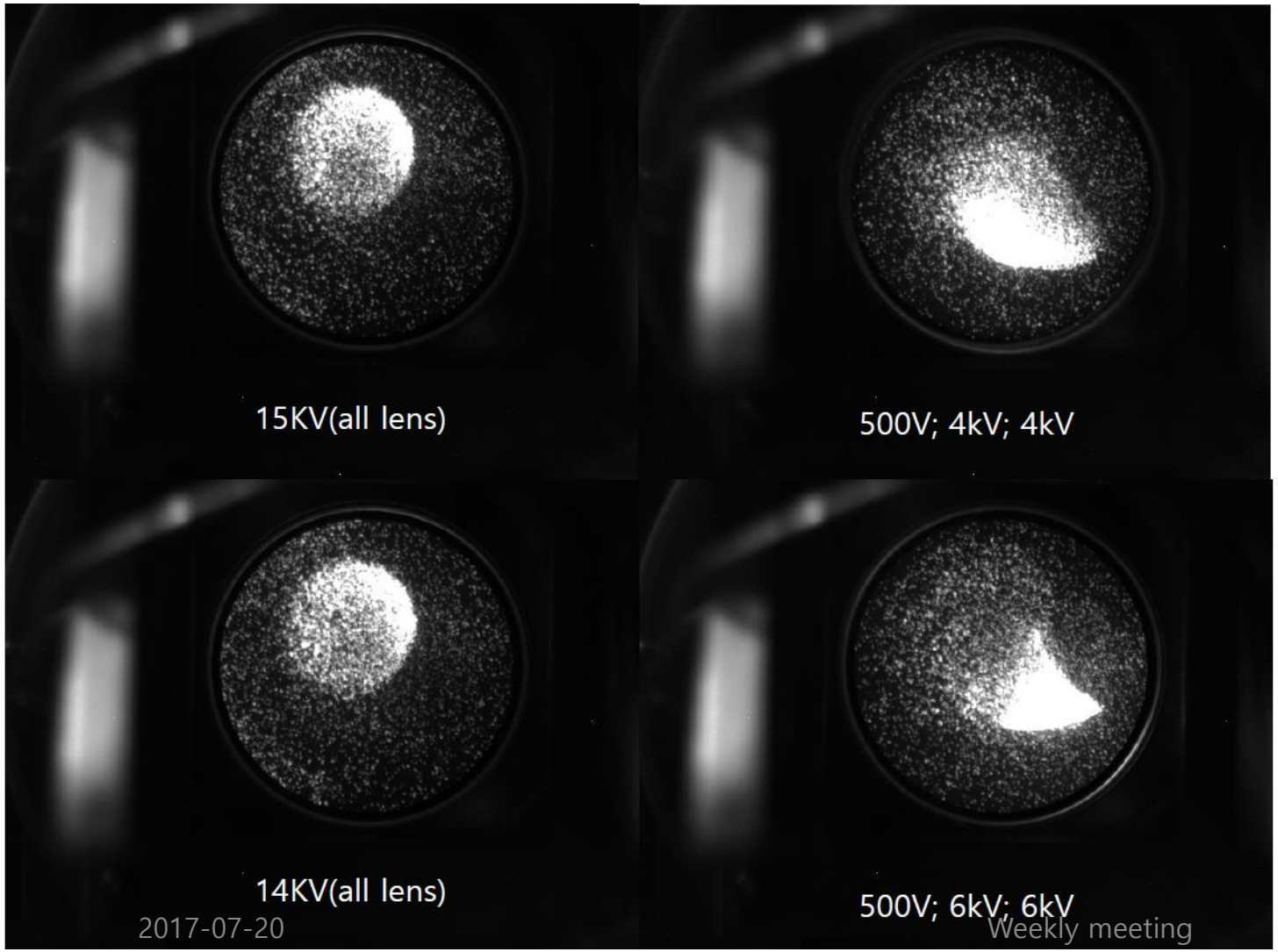
e+ beam line lens test



e+ beam line lens test

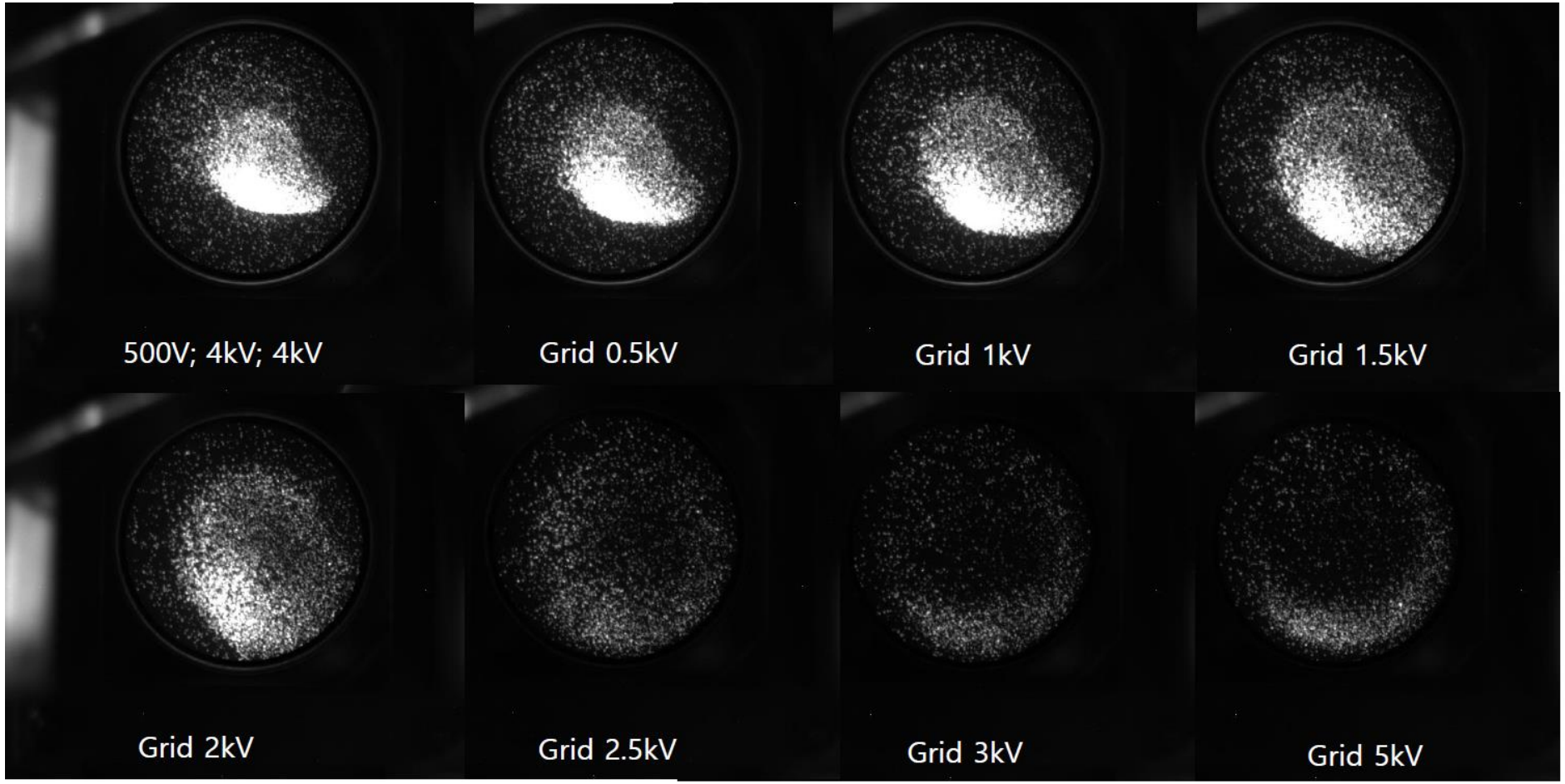


e+ beam line lens test



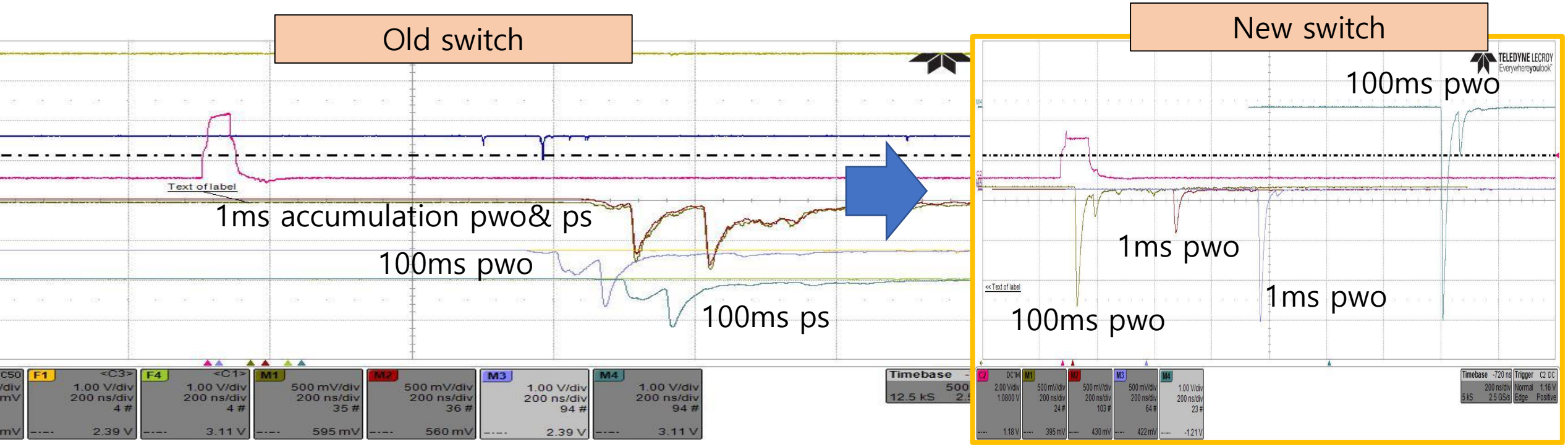
- Lens focusing is checked with changing HV for three lens.
- Beam center is moved by lens focusing.
- Beam shape is like hole shape in last electrode (focusing is not working well)

e+ beam energy scan



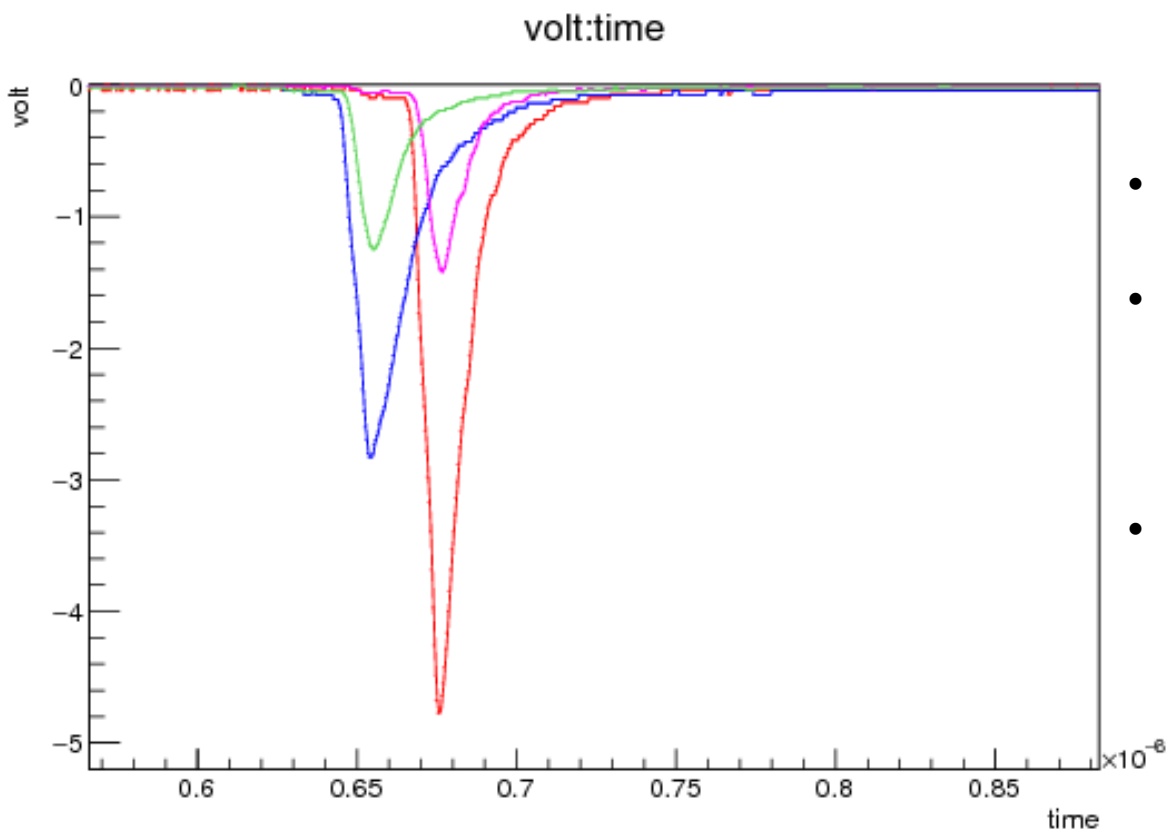
- Expected beam energy <2.5kV
- More study is required.

e+ time distribution with new switch



- Beam shape is changed (two peak → one peak)
- Reflection(?) is still shown.
- Signal width is about ~25ns (with new switch)
- In right figure, left two signals are measured after buncher and right two signals re measured at the end of beam line

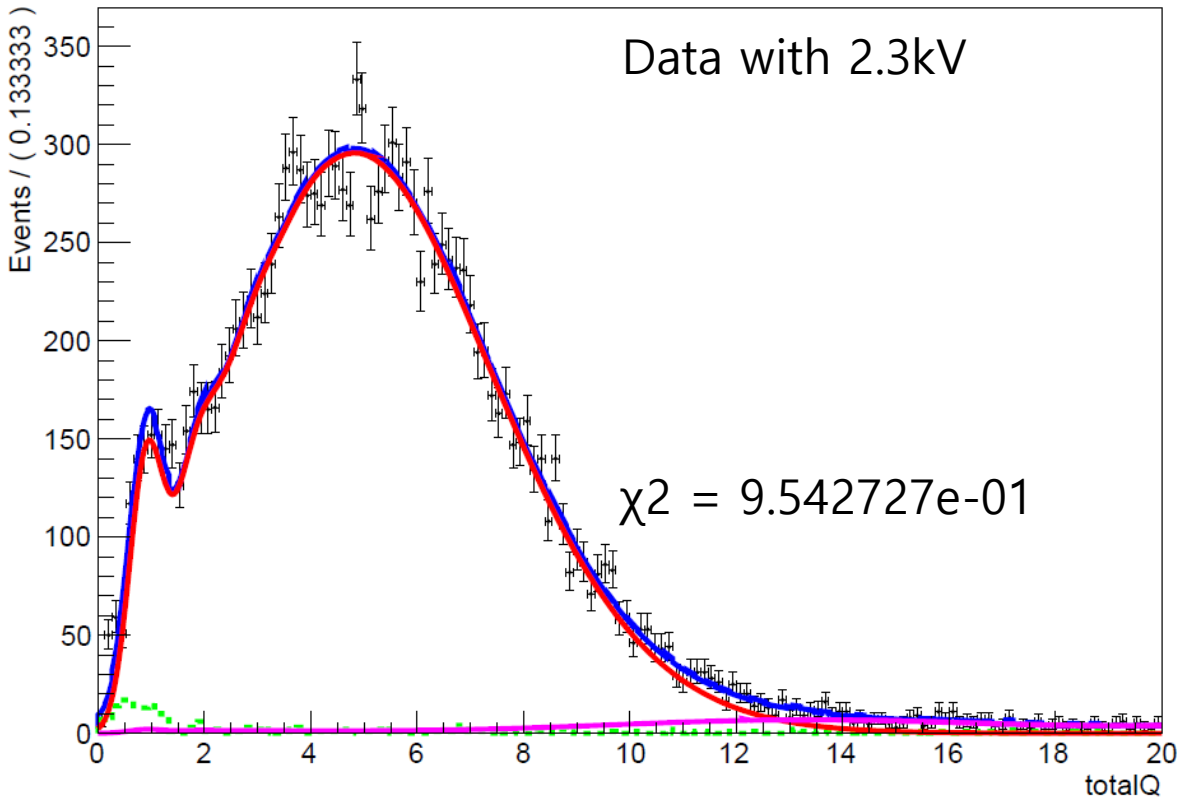
Time distribution in Antion chamber



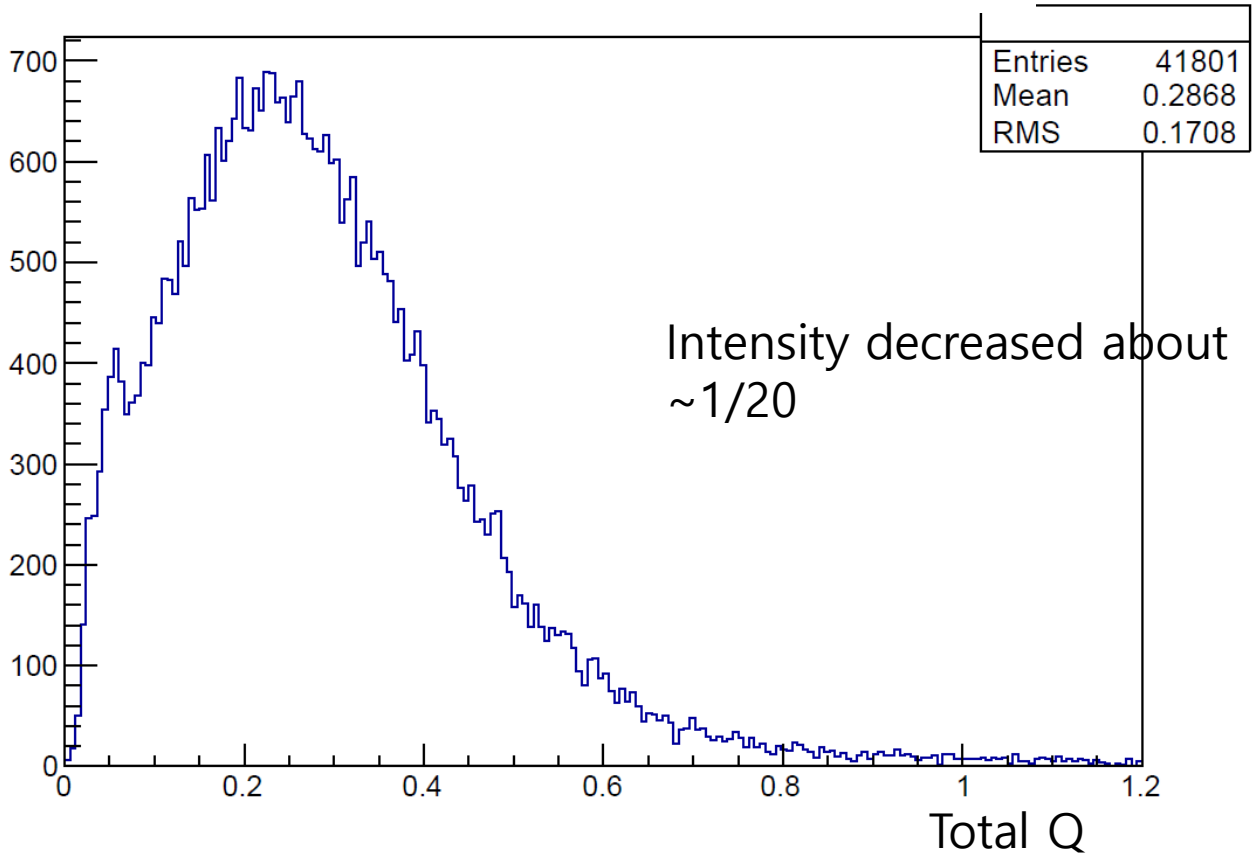
- After buncher tuning, reflection signal is disappeared.
- Because of high beam intensity, signal from PWO detector become above 5V (out of oscilloscope range)
- HV for PWO detector is decreased to 1.8kV from 2.3kV

PWO detector (back to back)

PWO Back to back (with PS)



PWO Back to back (with PS) 1.8kV



Status of CEA working

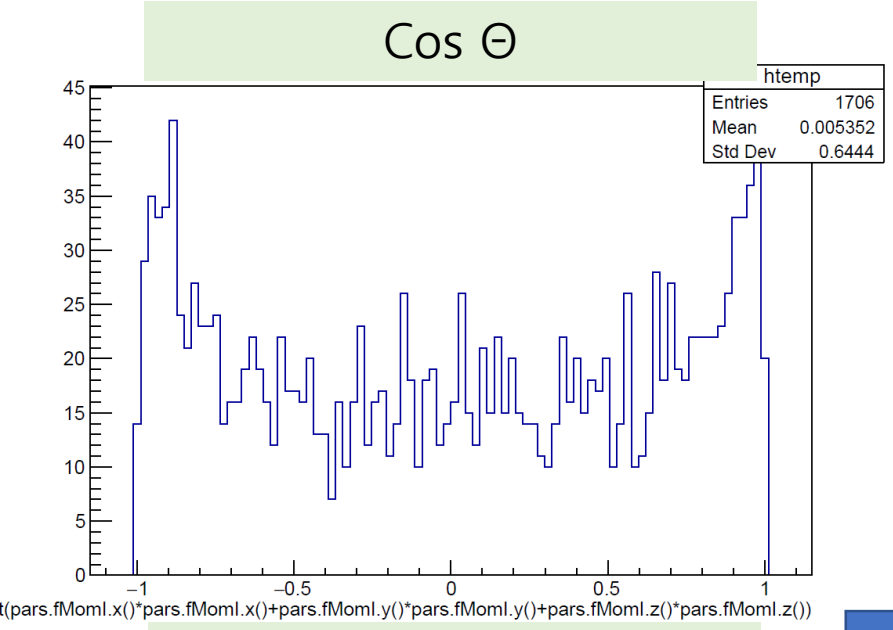
Positron beam line

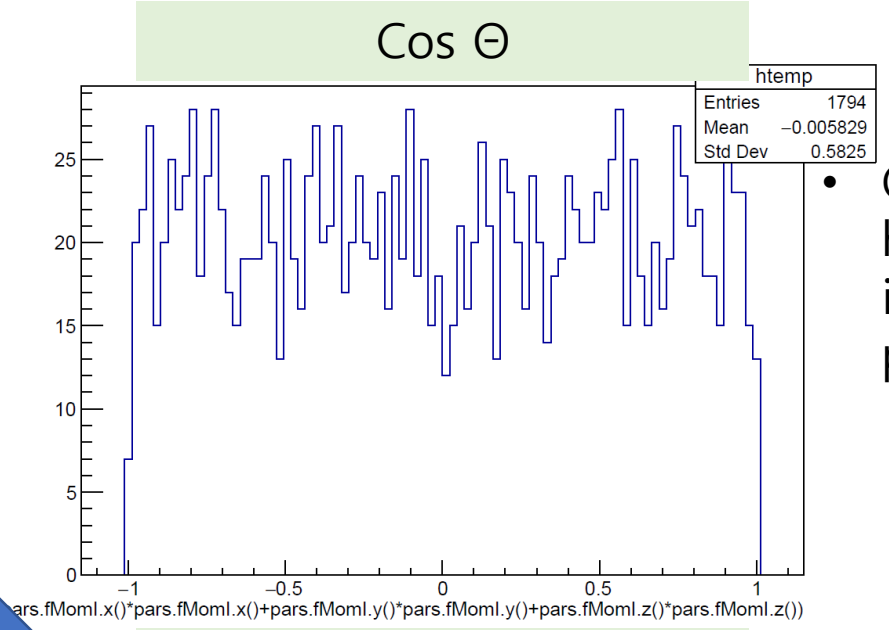
- Buncher time tuning (done)
- Lens tuning : ongoing but need more time

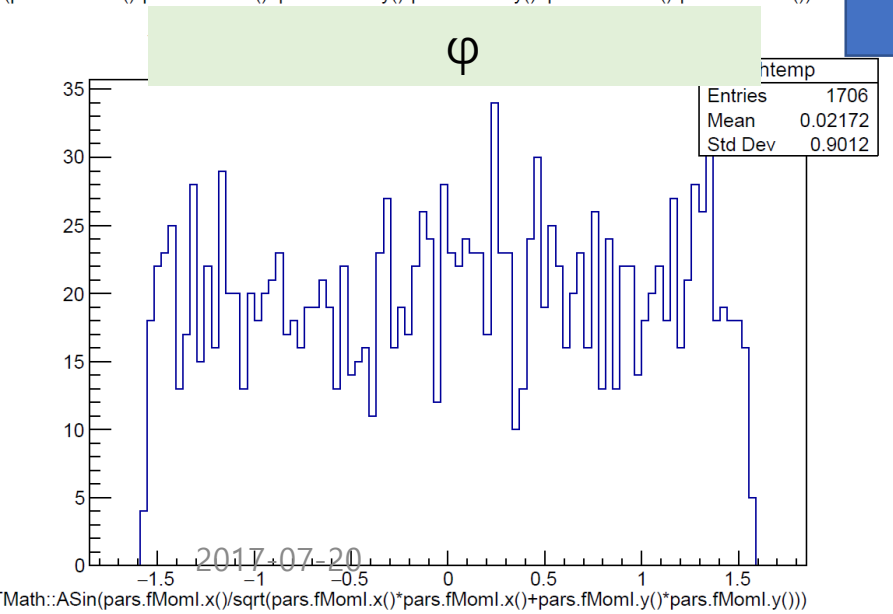
Proton beam line

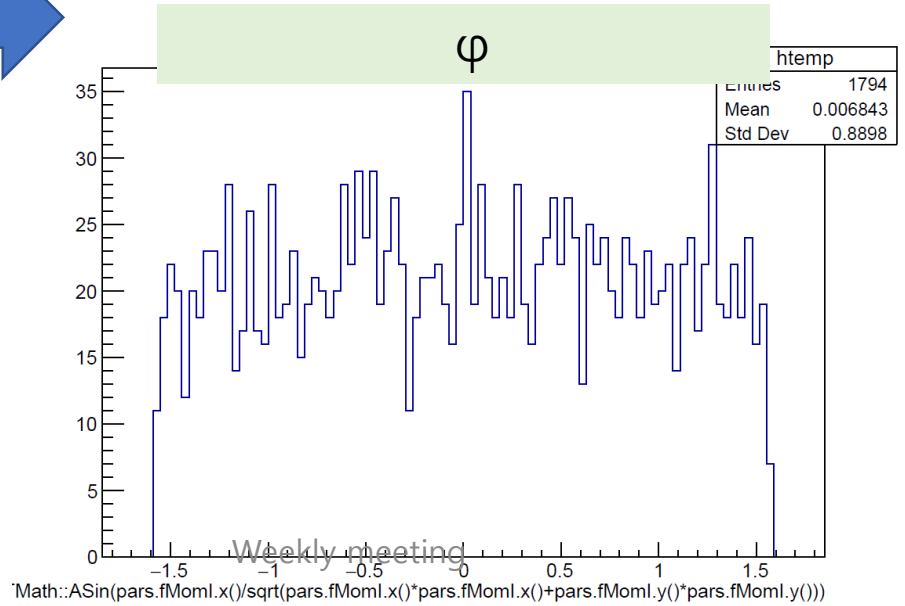
- Ongoing..

TOF simulation









- G4VPartonStringModel.cc and header is modified and added in kgbar folder and it works properly

To do list

- Positron beam line tuning
- TOF simulation with 4mm thickness
- Simple check for H-dibaryon search