Status report

14 Apr 2022
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Activity summary
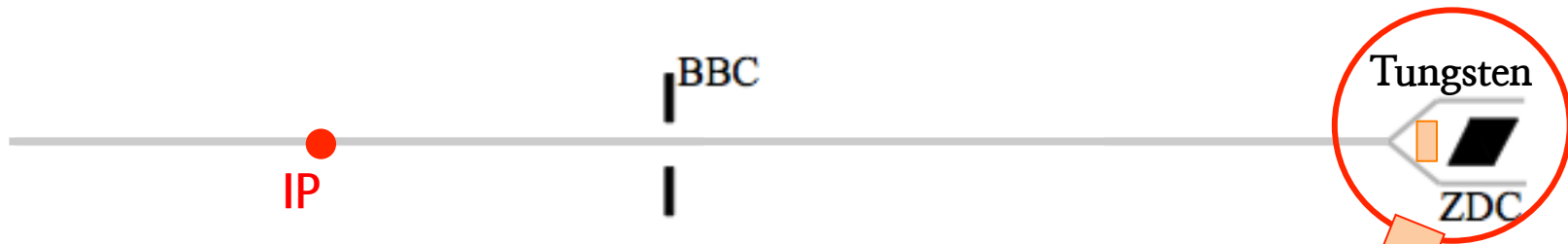
- ZDC performance in the RHICf-II experiment.

- RHICf-II detector configuration.

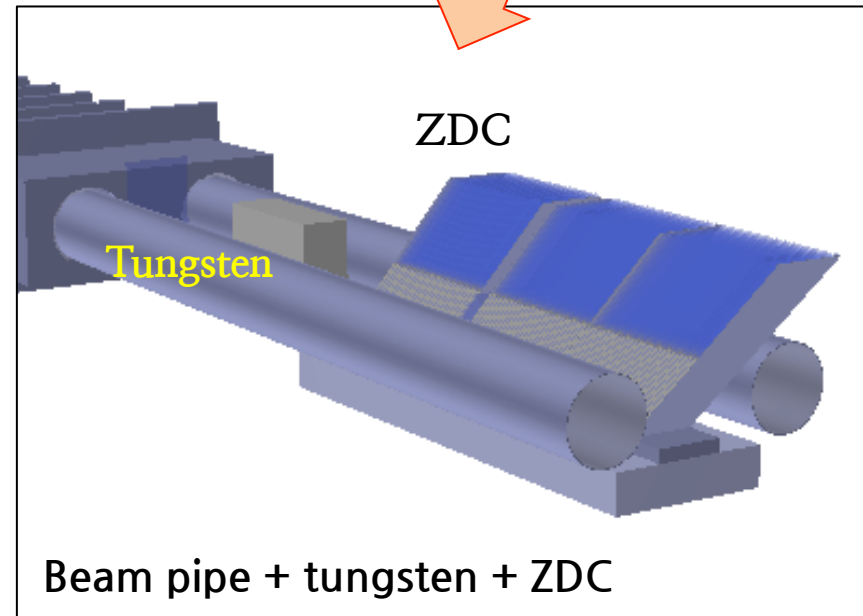**By last week**

- RHICf data analysis.

From this week

- FoCal trigger study.

Simulation setup
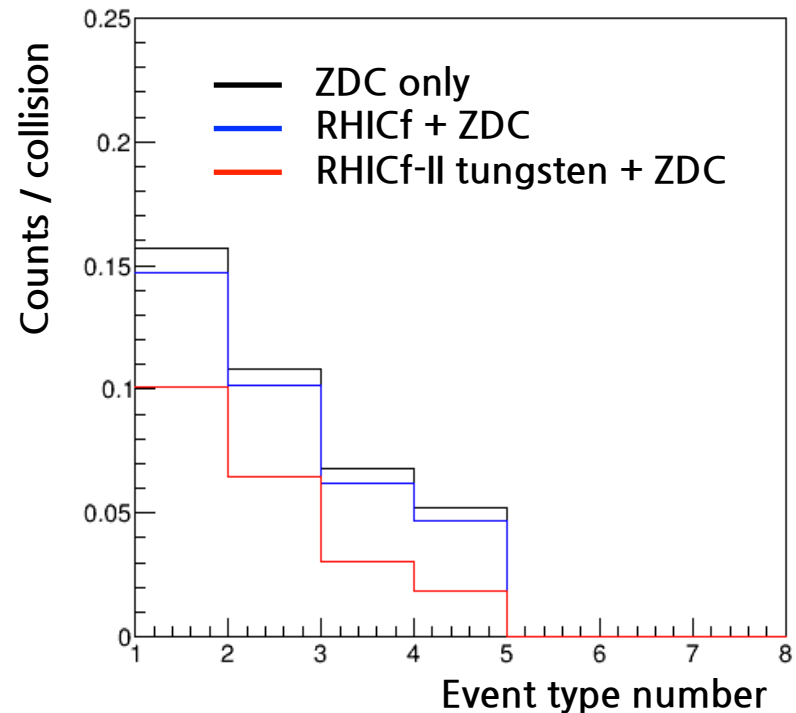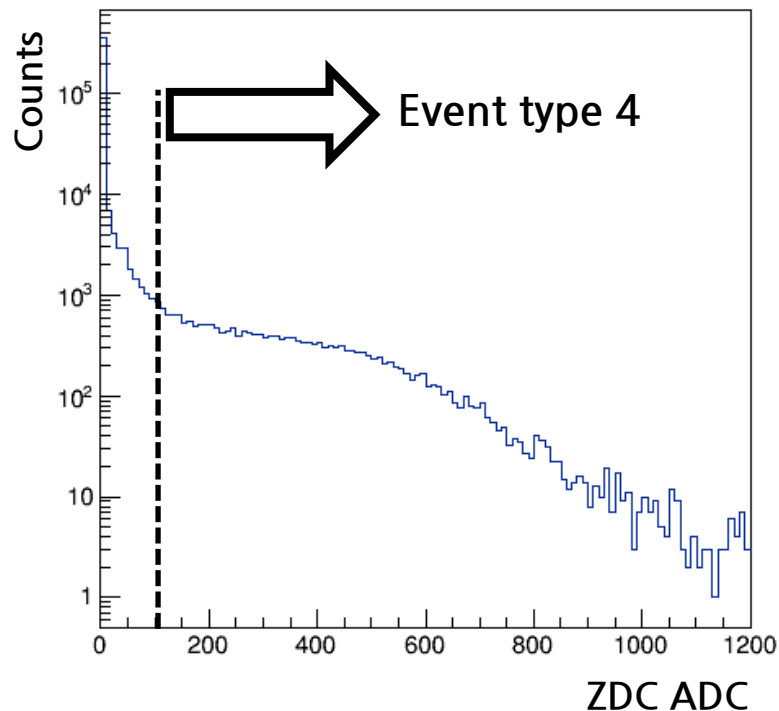

BBC

IP

Tungsten

ZDC

- A tungsten which has a comparable λ_{int} with the RHICf-II was positioned in front of the ZDC.

- Number of hits depending on the threshold was studied using the EPOS-LHC generator.

ZDC

Tungsten

Beam pipe + tungsten + ZDC

Number of hits in ZDC

Condition: All events at EPOS-LHC

Event type 4

ZDC ADC

- ZDC only
- RHICf + ZDC
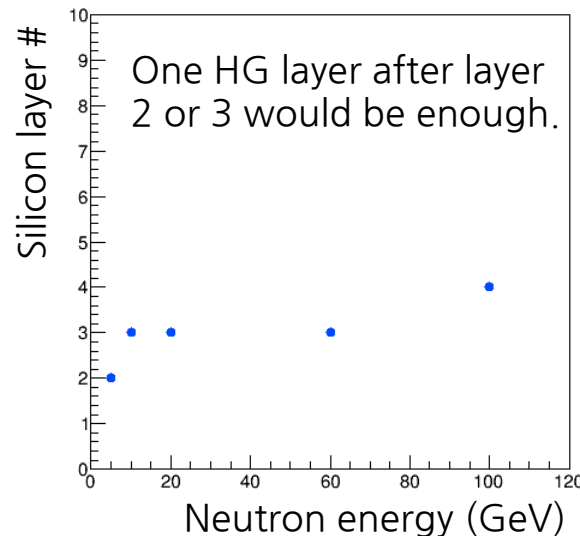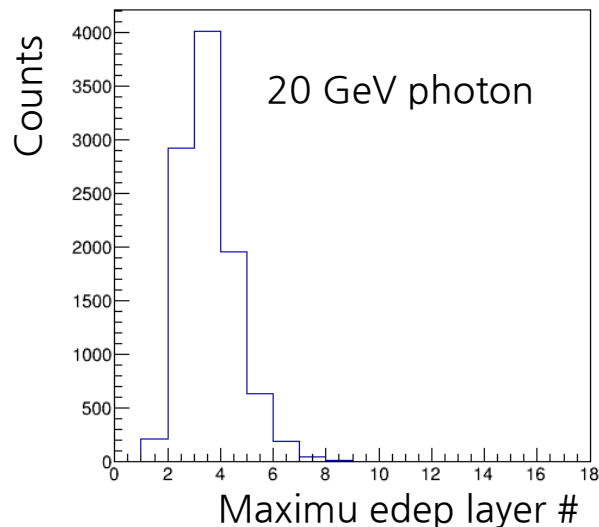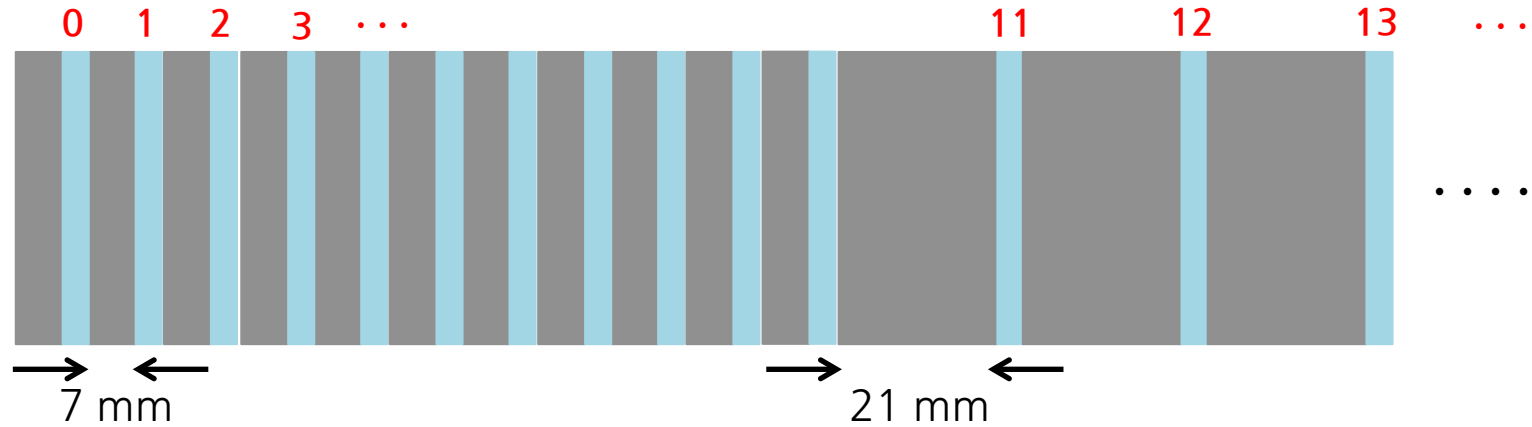- RHICf-II tungsten + ZDC

Event type number

- ■ ZDC ADC was temporarily defined by the summed number of Cherenkov photons generated in the ZDC.

- ■ Hits are counted if the ZDC ADC is larger than a threshold, 0, 10, 50, and 100 (x-axis in left figure) which are 0, 7, 35, and 70 MeV, respectively.

- ■ It seems that the RHICf-II coverage makes the ZDC rate suppressed.
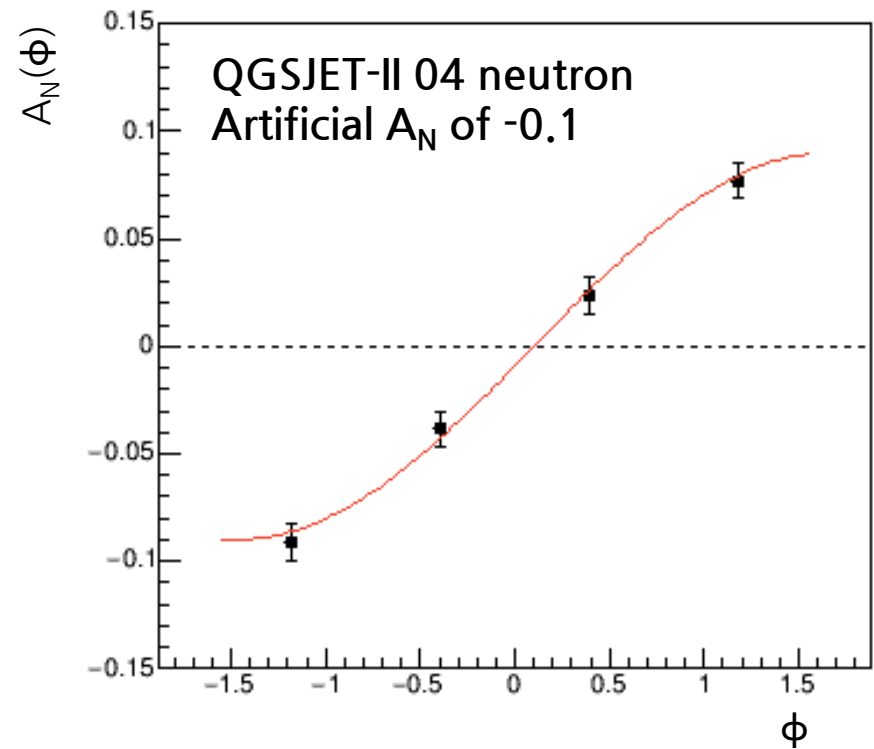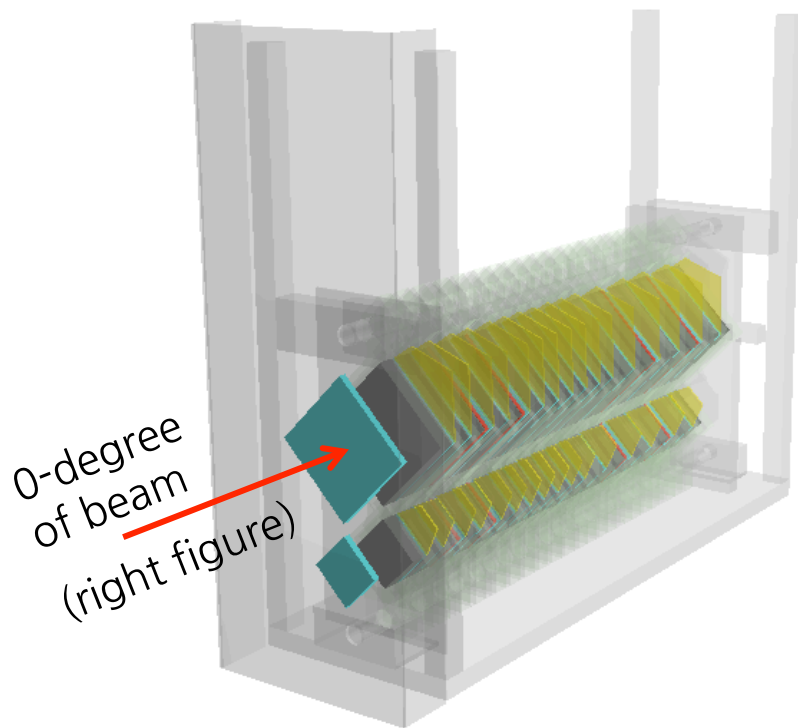
First HG layer

■ : Tungsten

■ : Glue + silicon + glue + readout

11 thinner + 7 thicker layers

0　1　2　3　· · ·　　　　　　11　　12　　13　· · ·

→ 7 mm ←　　　→ 21 mm ←

20 GeV photon

Counts

Maximu edep layer #

One HG layer after layer 2 or 3 would be enough.

Silicon layer #

Neutron energy (GeV)

■ Efficiencies of after layer 2 and 3 are comparable.

■ Position resolution is better for after layer 2.

■ After layer 2 is the best position for the first HG location.

QGSJET-II 04 neutron
Artificial A_N of -0.1

- Front counter will be used to estimate the background A_N specifically.

- Three dimensional unfolding will be done to solve the Φ smearing.

FoCal trigger study

- Planning to understand and debug the data Ionut provided referring to Takuya and Shimizu-san's slides.

- Jobs will be assigned once the data which has enough information is distributed.