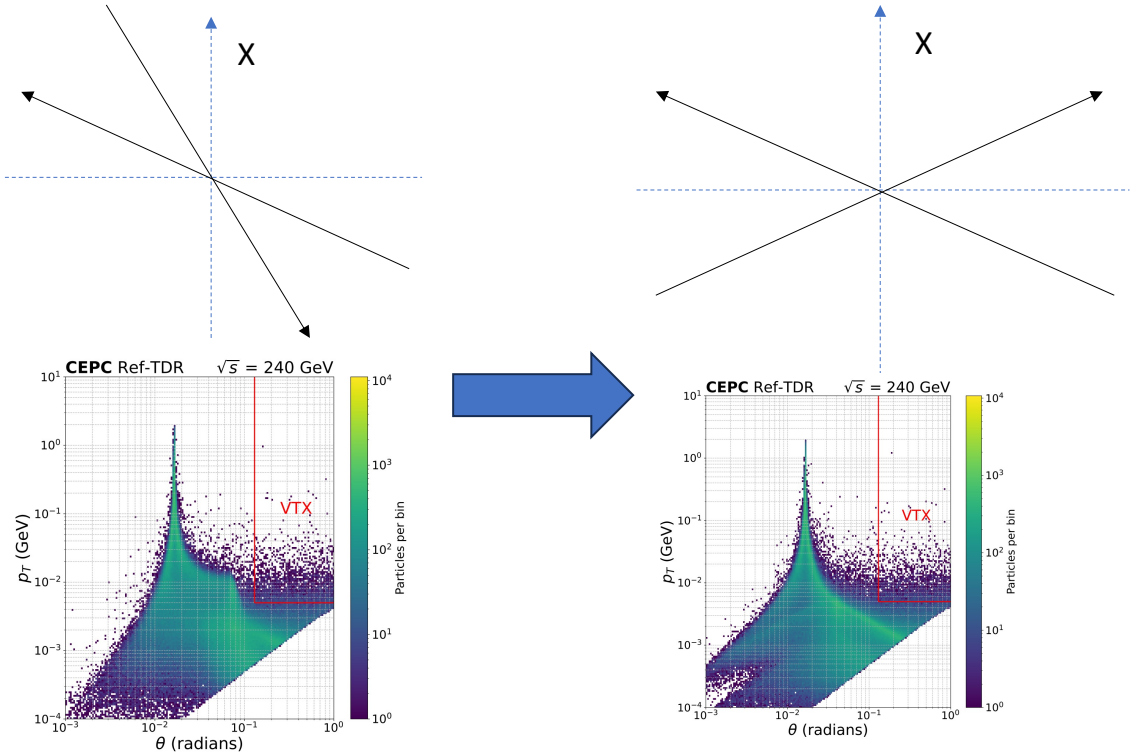
Status

- The updates on BG simulation is on going.
  - SR: Finished the coding of the new generator with re-weighting. Testing in progress. We set ~50 steps in simulation. Can not be finished before Review.
  - Single Beam loss: New lattice with Solenoid(No Beam-beam) has been tested. Generation and accelerator tracking on going.
    - Accelerator Tracking finished last week for BTH/BGB/TSC, BGC is still simulating. Adjustment of the collimator is ongoing based on IR lossmap.
    - Detector simulation will be started after acc-tracking finished.
  - Pair Production: Physics group did a lot of check. We see less hits on VTX with B field(uniform). (~5.1→1.2 MHz / cm^2).
  - Non-uniform B field in detector simulation: The B field can be loaded successfully(thanks to the Software and Magnet colleagues). Simulation on going, can be done before the review for some of the sources.

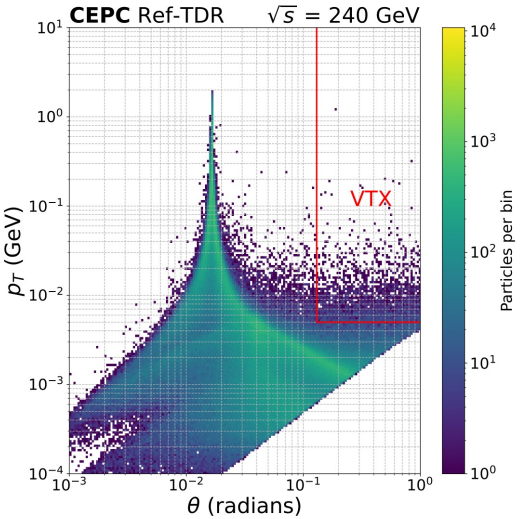
Pair Production - Generation

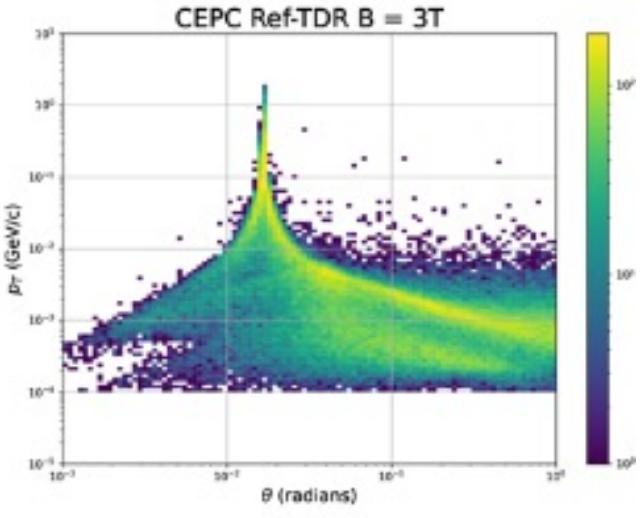
- Chenguang and Xiaotian did a lot of check. Thanks to them.



Pair Production - Generation

- Chenguang and Xiaotian did a lot of check. Thanks to them.
- Currently, we have two versions:
  - Simply change the phi in boost code to minus. Plus angle, 5 MeV cut(v1).
  - Keep the phi in boost code at plus. Minus angle, 0.511 MeV cut(v2).





Pair Production - Detector Simulation - 1

- We performed a detector simulation using CEPCSW 25.5 with generator v1. Compared with old results in May.
  - Slightly decreased hit rate.

```
Number of files: 2000
Number of hits in VXD L1: 1839637
Number of hits in VXD L2: 1138610
Number of hits in VXD L3: 514045
Number of hits in VXD L4: 367173
Number of hits in VXD L1: 0.5457424320527683 hits in cm^2/MHz
Number of hits in VXD L2: 0.15051329461659807 hits in cm^2/MHz
Number of hits in VXD L3: 0.038272641600419 39 hits in cm^2/MHz
Number of hits in VXD L4: 0.01750964885149231 hits in cm^2/MHz
```

May Results

```
Number of files: 2000
Number of hits in VXD L1: 1709905
Number of hits in VXD L2: 1045509
Number of hits in VXD L3: 446435
Number of hits in VXD L4: 284167
Number of hits in VXD L1: 0.507256438786124 hits in cm^2/MHz
Number of hits in VXD L2: 0.13820623755395162 hits in cm^2/MHz
Number of hits in VXD L3: 0.033238815187159 16 hits in cm^2/MHz
Number of hits in VXD L4: 0.013551280691069374 hits in cm^2/MHz
```

Results based on v1

Main Changes in MDI from CEPCSW 25.5-25.8

- B Field: Uniform → Non-uniform
- Beam pipe Geometry:
  - Fix the error on mask setting (asymmetry on 1.9m SR mask)
  - Be window in extending pipe has been added
  - Extend the beam pipe to 20m. Add the -7.2 m SR mask, and -19 m Collimator.

Pair Production - Detector Simulation - 2

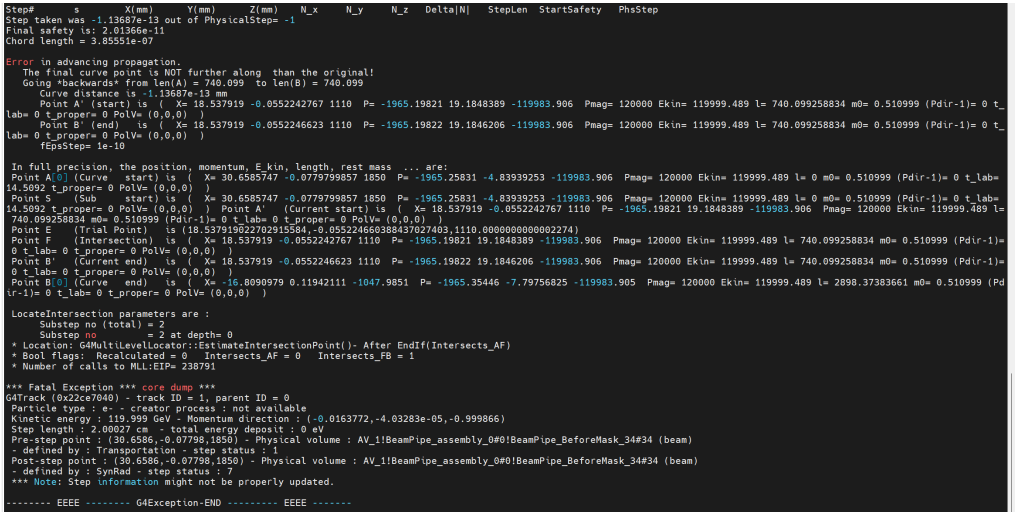
- We performed a detector simulation using CEPCSW 25.8 with generator v2.
  - Main reason of the increase might be the increase of pairs.

Ave Hit Rate on VTX [MHz/cm2]

	250514	250823(v2)
1	1.23	2.67
2	0.34	0.36
3	0.09	0.07
4	0.04	0.02
5	0.01	<0.01
6	0.01	<0.01

SR - 1

- Currently, no new versions available.
- For Non-uniform B field with previous generator(CEPCSW), we face some trouble that the lots of the particles have been killed during tracking.
  - SynRad turned off at CEPCSW by default.

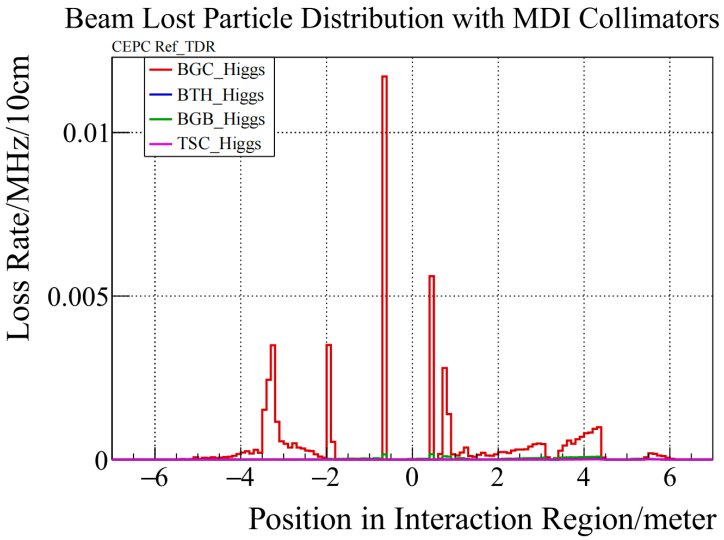


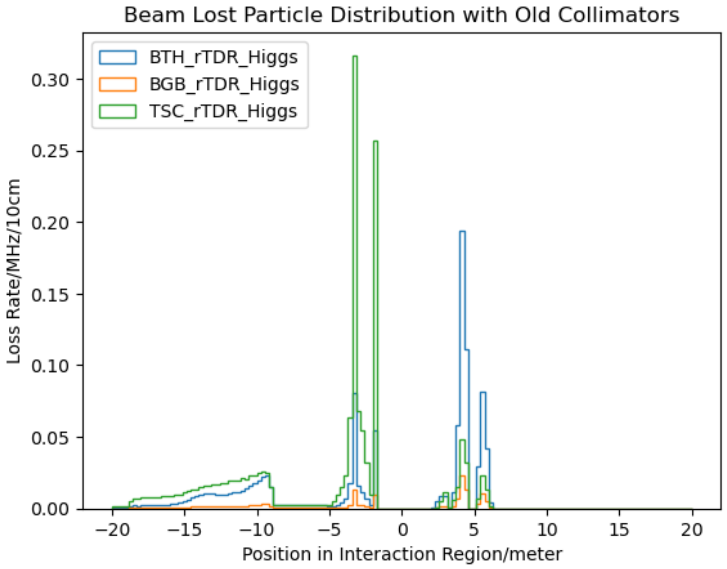
SR - 2

- Currently, no new versions available.
- For Non-uniform B field with previous generator(CEPCSW), we face some trouble that the lots of the particles have been killed during tracking.
  - SynRad turned off at CEPCSW by default.
- For new generator, we faced the trouble that the electron do not behave properly(off-track). We are discussing with accelerator colleagues.
  - We also plan to take a look at BDSIM again

Single beam loss - 1

- We got a new version with solenoid and antisolenoid. No beam-beam.
- We incidentally ran a version including BGB/BTH/TSC without collimators and masks. The IR loss is higher than current version in TDR.





Single beam loss - 2

- We added previous settings of the collimators and performing the simulation. They are still running.
- Preliminary results of TSC and BGC suggested that the optimization of the collimators is needed, which is ongoing.