
Proton beam gas with new thresholds

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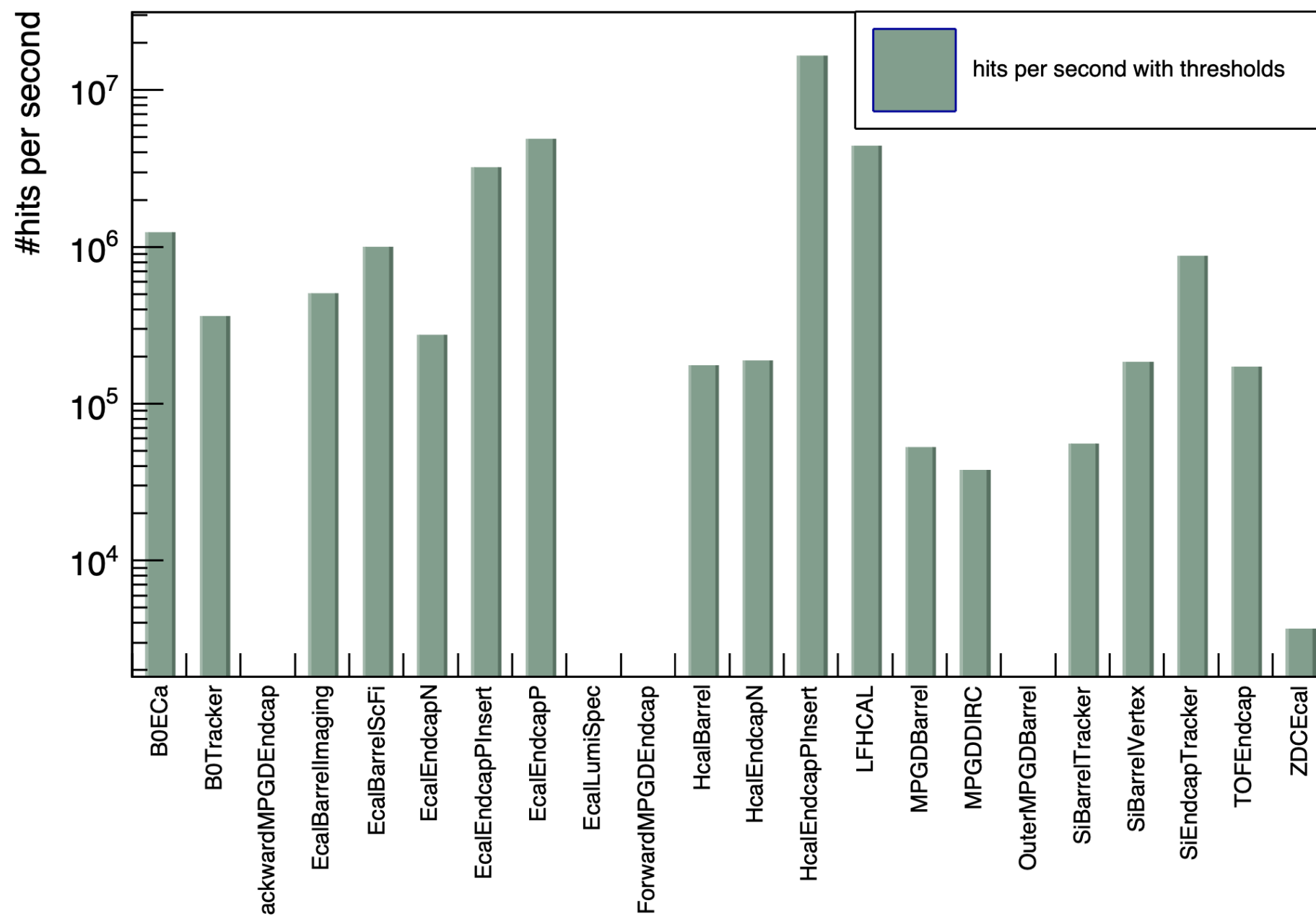
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2023.12.19

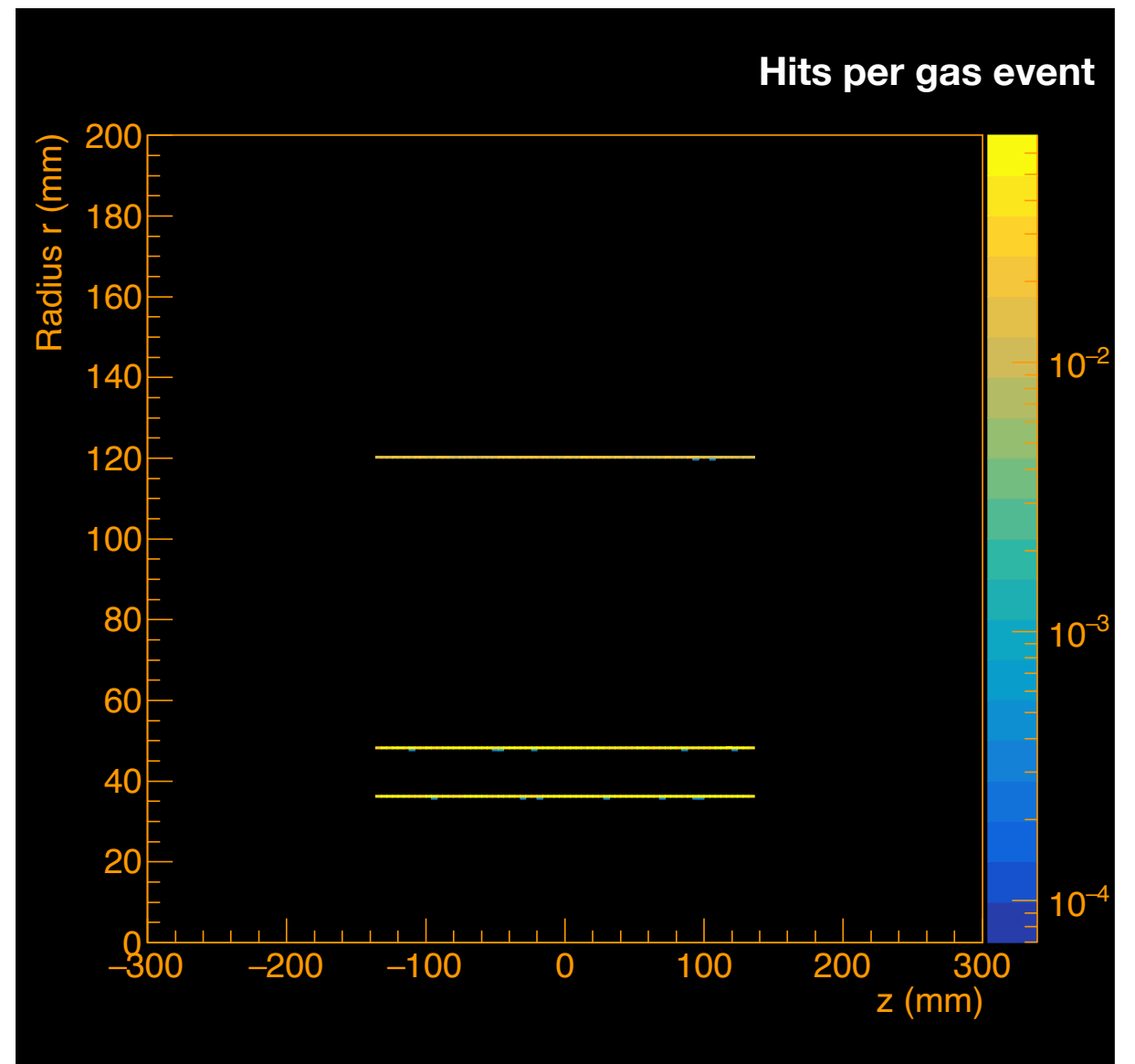
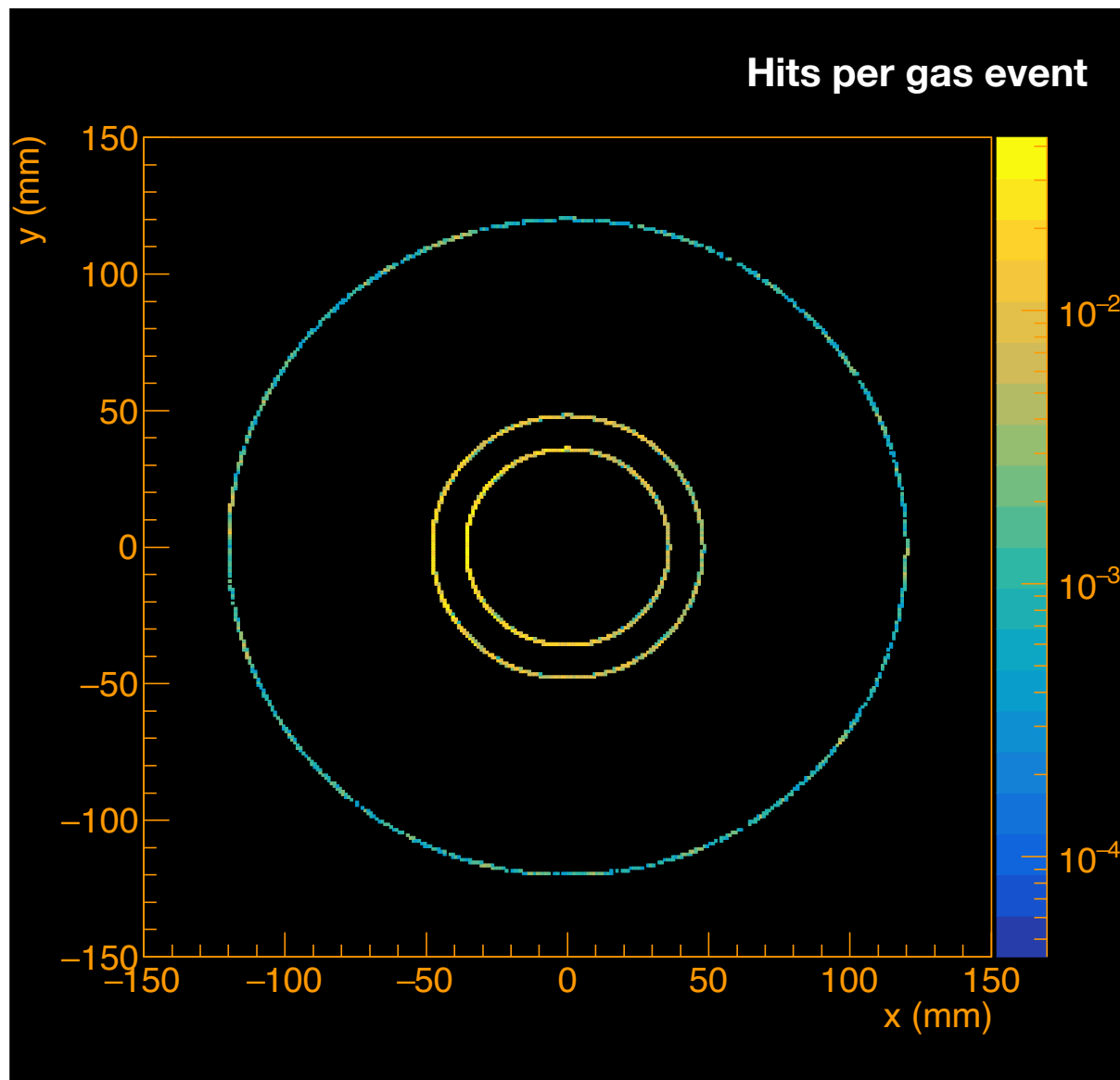
Procedures

- HepMc3 files produced by Pythia8 can be found in **/gpfs/mnt/gpfs02/eic/zhangzq/EPIC/eic/protonBeamGasEvents_Pythia8**
- `source /opt/detector/setup.sh`
- `ddsim --compactFile $DETECTOR_PATH/$DETECTOR_CONFIG.xml --numberOfEvents 10000 --inputFile 275GeV_HiAc_25mrاد_Asciiv3.hepmc --outputFile protonBeamGas.edm4hep.root eicrecon`
- `eicrecon protonBeamGas.edm4hep.root eicrecon`
- The RecHits should be the hits with all the thresholds

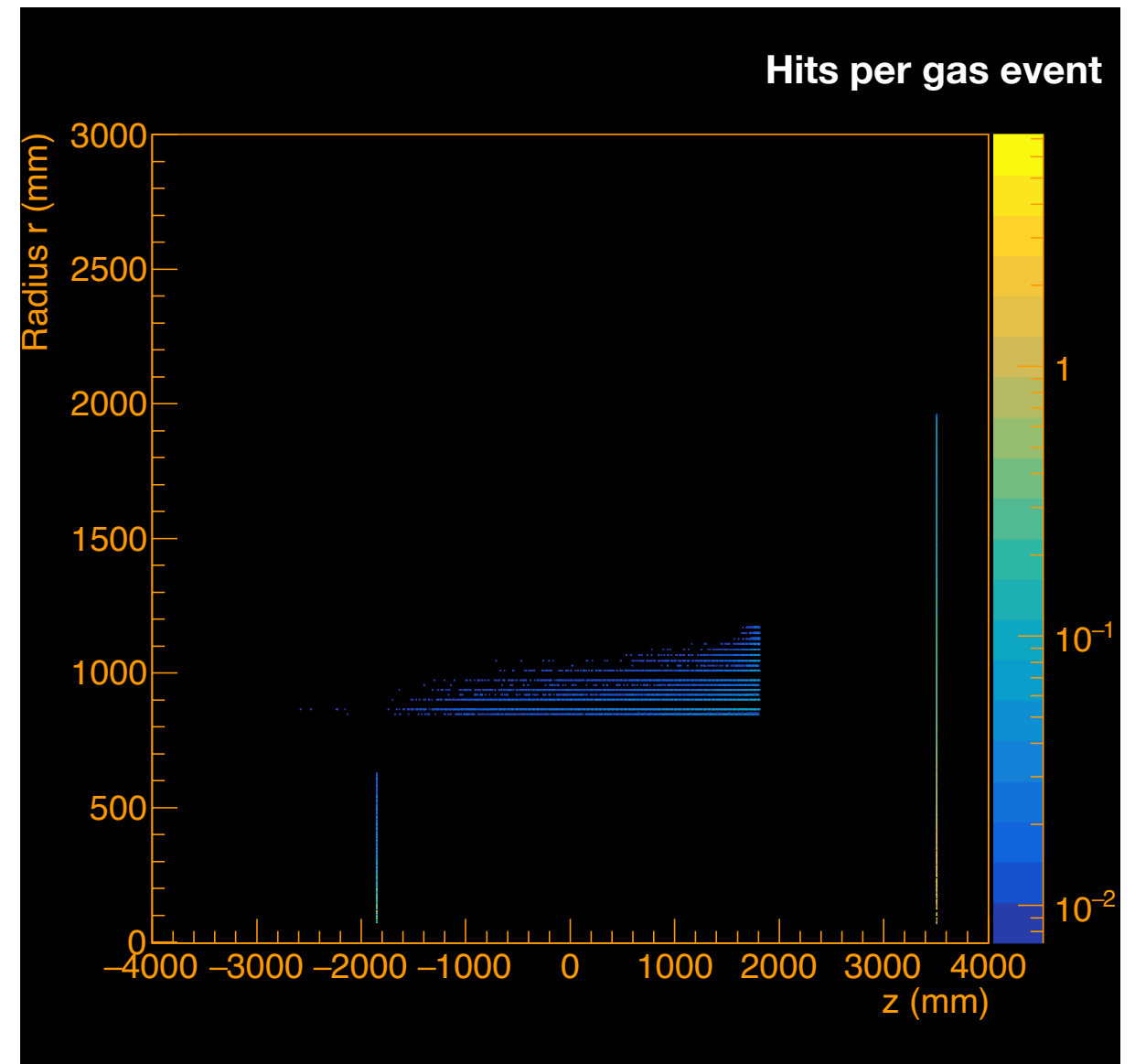
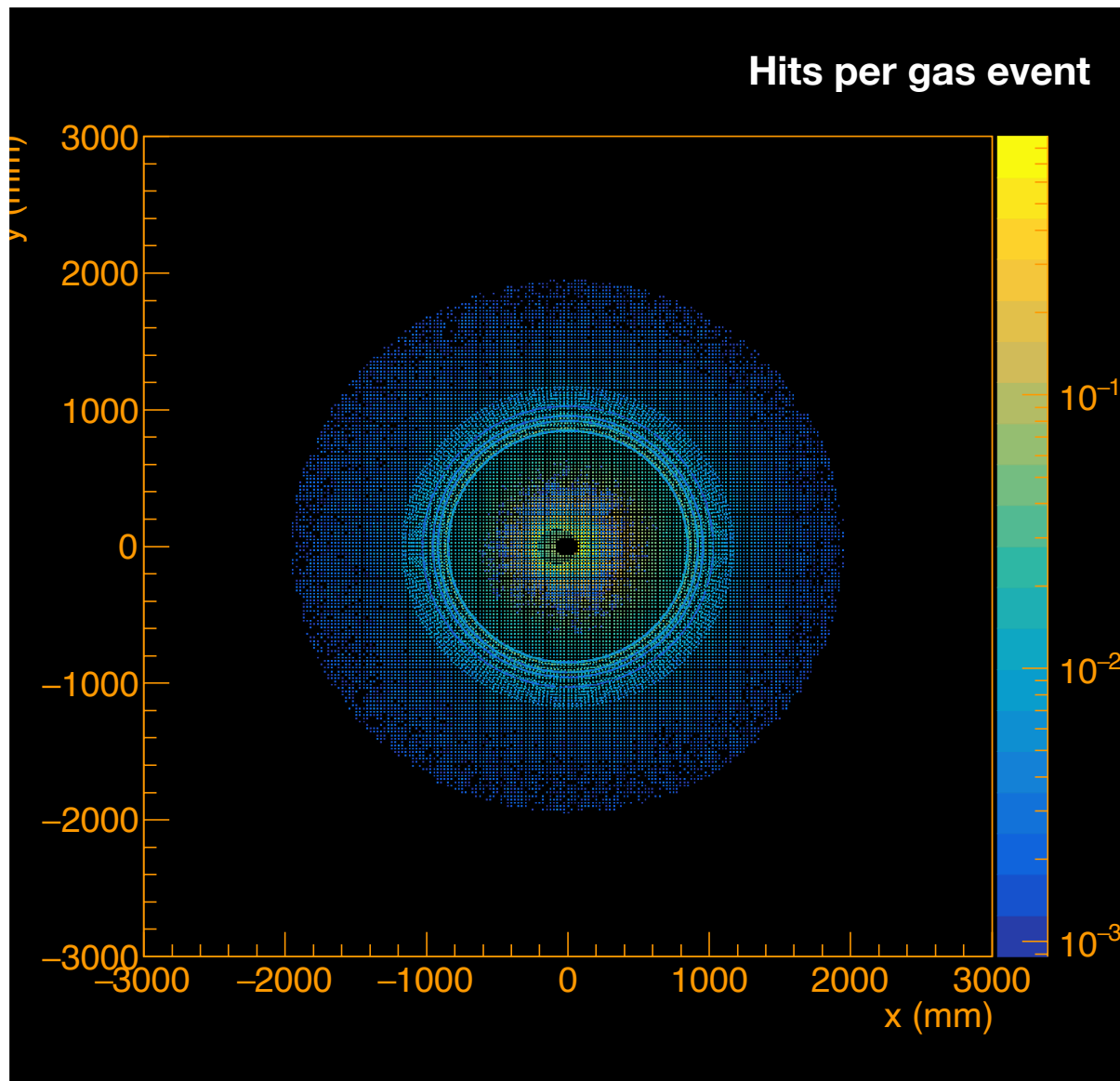
Hits rate in each sub detector



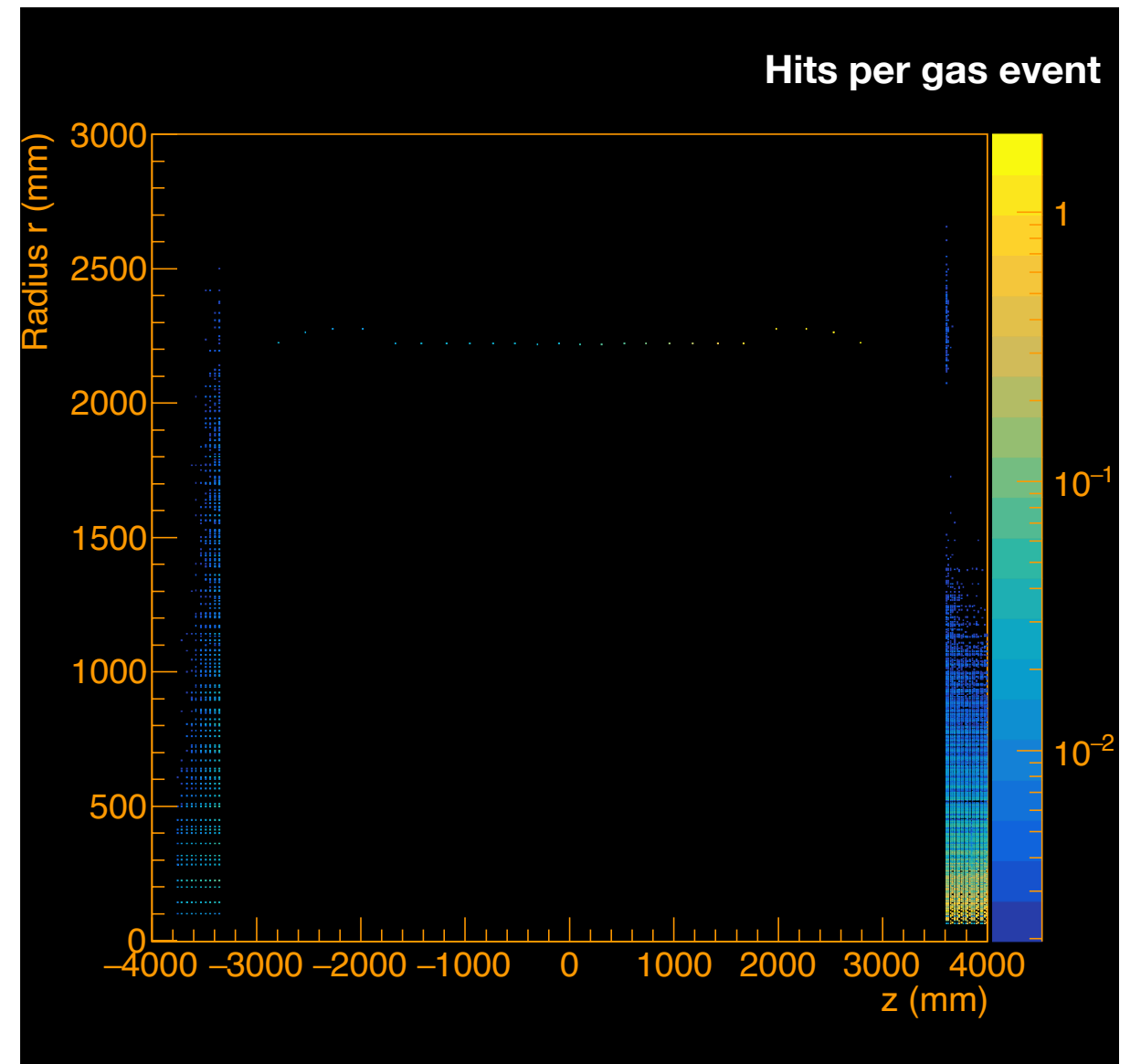
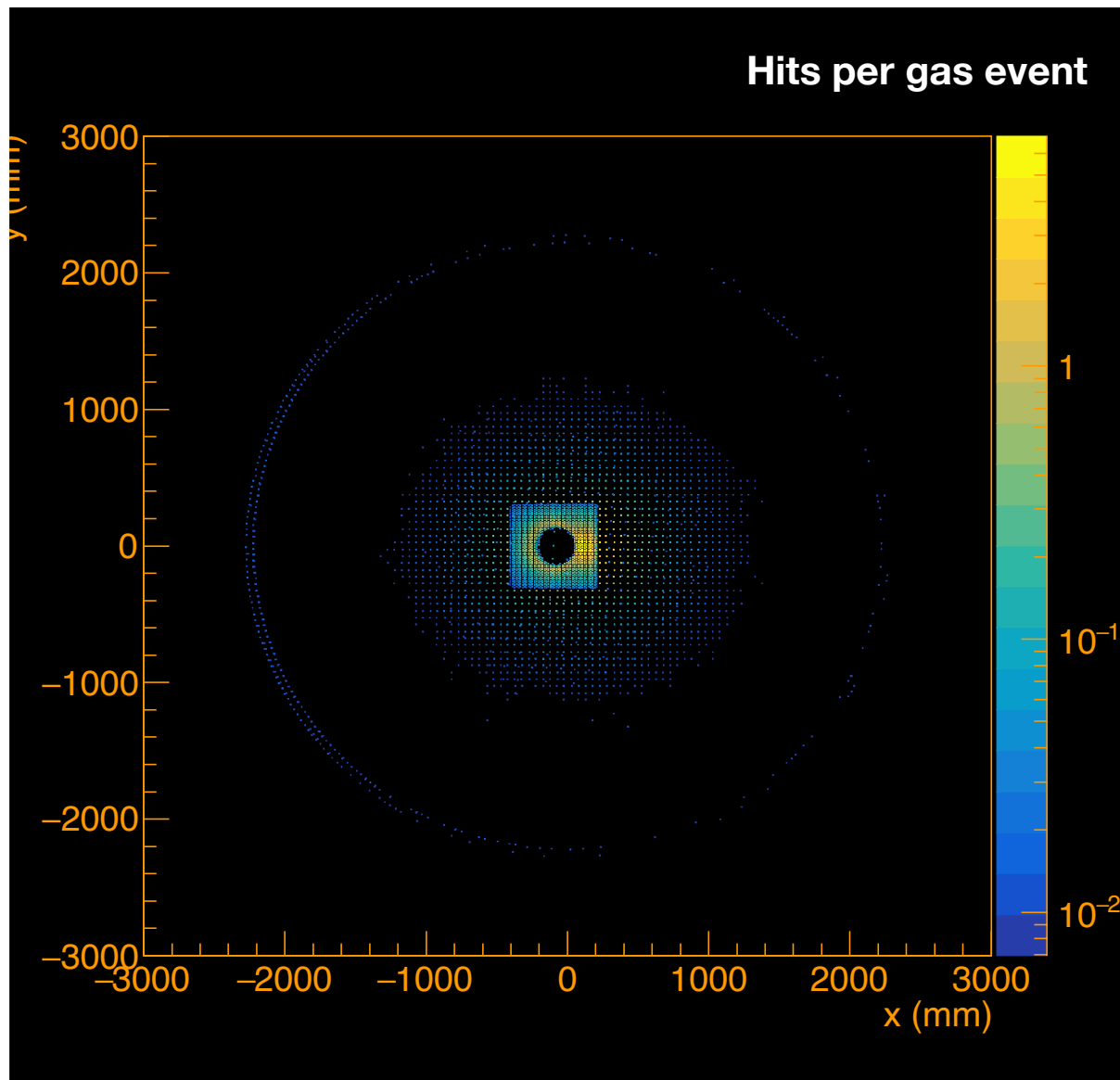
VertexBarrel Hits Distribution



Electromagnetic calorimeters, EcalBarrelSciGlass+EcalEndcapP + EcalEndcapN +EcalEndcapPInsert



Hadron calorimeters, HcalBarrel + HcalEndcapN + HCalEndcapPInsert + LFHCAL



Questions

```
HcalBarrelRecHits.sector = 1, 6, 7, 9, 3, 19, 8, 27, 12, 15, 20, 21, 16, 2
HcalBarrelRecHits.layer = 45, 21, 46, 21, 16, 23, 21, 44, 47, 21, 45, 47,
```

Can we associate the hits with the readout channels using the information from Hits.sector and layer, so we can identify which readout channel each hit belongs to?

```
EcalEndcapPRecHits.sector = -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1  
EcalEndcapPRecHits.layer = -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1, -1
```

Next

- Determine the peak rate for each individual readout channel in every sub-detector.
- Analyze DIS events with the new thresholds.