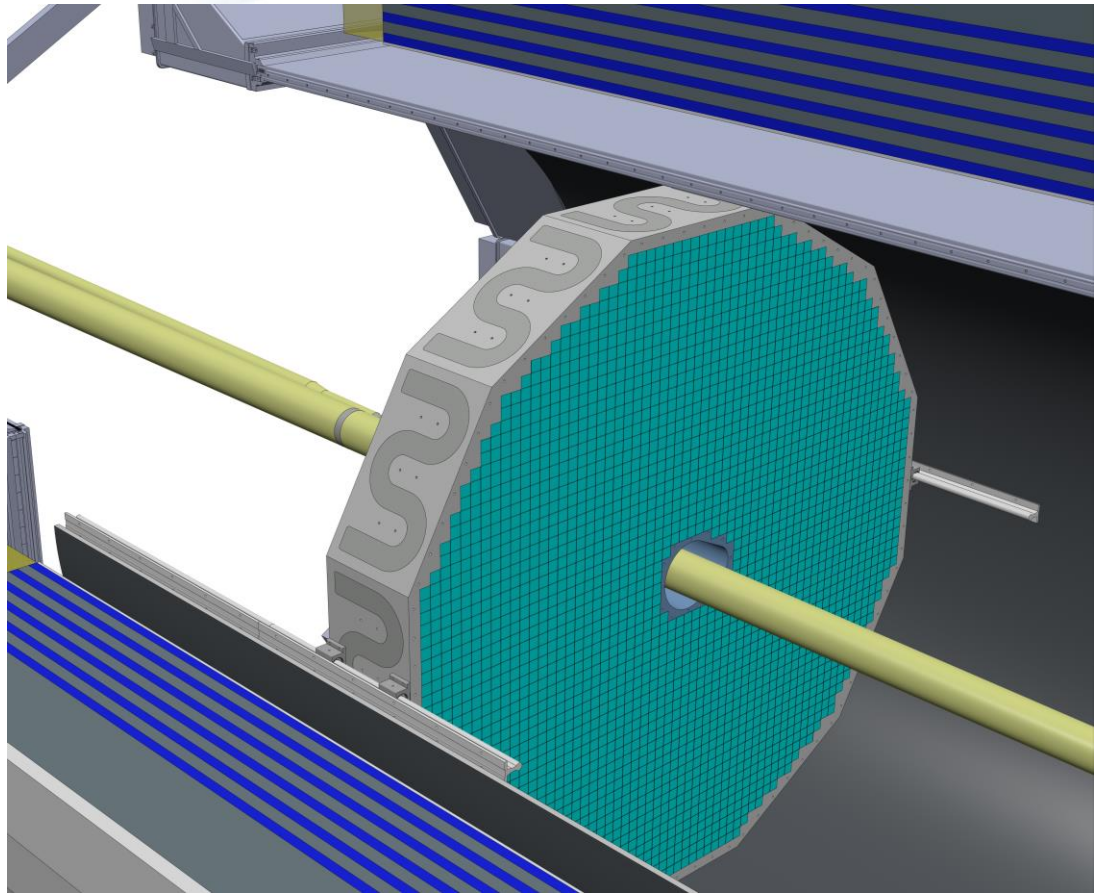


Backward Ecal:

CALOROC requirements

C. Muñoz

ePIC Collaboration Meeting

Jan 21, 2026

Questions

1. What is the capacitance of the detector per channel? (pF)
2. What is the lowest signal measurement required? (fC)
3. What is the highest signal measurement required? (fC)
4. Do you have a measurement with certain settings of MIP peak, other fixed signal? (With the H2GCROC and settings)
5. What is the charge resolution requirements? (Percentage as a function of charge, not in bits)
6. What is your timing requirements/measurements?
7. What is the expected occupancy per channel from simulation? (Including full background)
8. What is the maximum hit rate per channels needed if all channels are activated at the same time?
9. What is the expected dark noise rate?
10. What is the maximum hit rate required for a single channel? (If only one receives signal)
11. What is the double pulse separation needed? Overlap signals from two independent bunch crossings? (This affects small or large signals differently in your detector?)
12. How many number of samples you require as minimum (max is 7 now in CALOROC)?
13. What is the preference for A or B for CALOROC?

Questions

1. What is the capacitance of the detector per channel? (pF)

530 pF - 8800 pF (16 3x3 mm2 SiPM – 4x 6x6 mm2 SiPM)

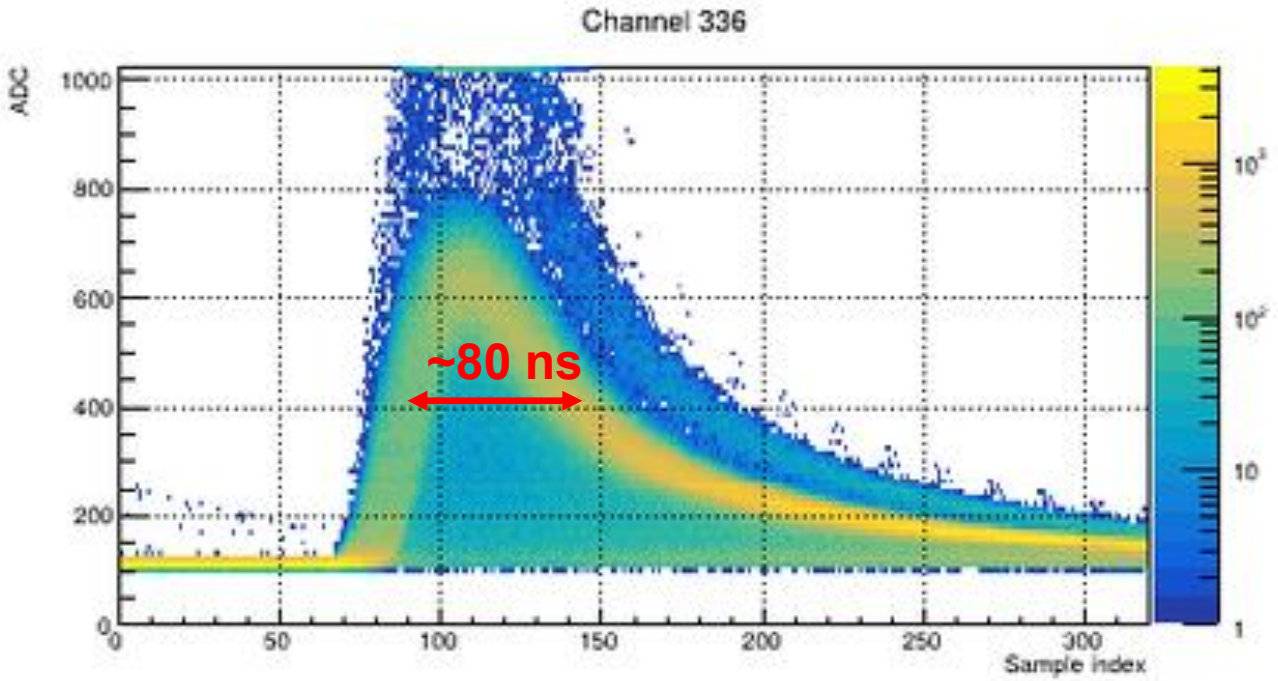
2. What is the lowest signal measurement required? (fC)

5 MeV – 36 pixels - 2 pC (at 4V overvoltage)

3. What is the highest signal measurement required? (fC)

18 GeV – 26k pixels - 7.2 nC (at 4V overvoltage)

4. Do you have a measurement with certain settings of MIP peak, other fixed signal? (With the H2GCROC and settings)



- 1 GeV electrons at DESY
- 3x3 mm2 SiPM
- CC=12, Rf=3

Questions

5. What is the charge resolution requirements? (Percentage as a function of charge, not in bits)

<1% from electronics (total detector: 2-3%/sqrt ⊕ 1-2%)

6. What is your timing requirements/measurements?

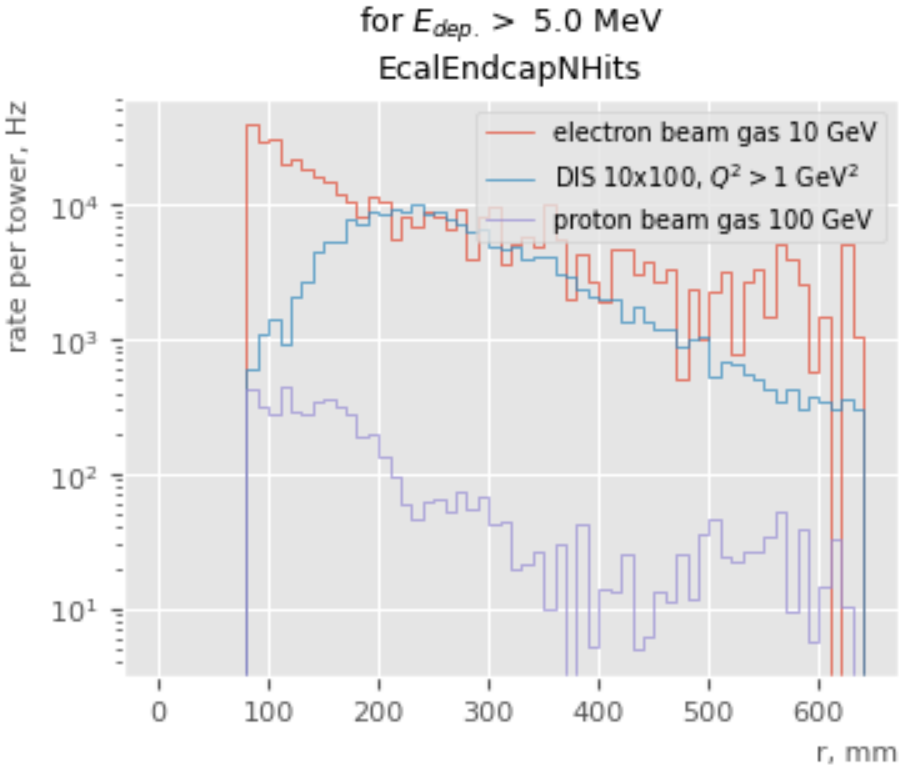
N/A

Questions

7. What is the expected occupancy per channel from simulation? (Including full background)

Very low:

~1e-4 per bunch crossing



Latest ePIC simulation campaign

8. What is the maximum hit rate per channels needed if all channels are activated at the same time?

1e4 Hz

Questions

9. What is the expected dark noise rate?

Below 5 MeV threshold after 100 fb-1 irradiation

10. What is the maximum hit rate required for a single channel?

See above: ~1e4 Hz

11. What is the double pulse separation needed? Overlap signals from two independent bunch crossings? (This affects small or large signals differently in your detector?)

N/A

12. How many number of samples you require as minimum (max is 7 now in CALOROC)?

3-4 samples should be enough, based on signal width

13. What is the preference for A or B for CALOROC?

B, if it performs as expected

Backup