TCS Beam Background
(Jan. 2019)

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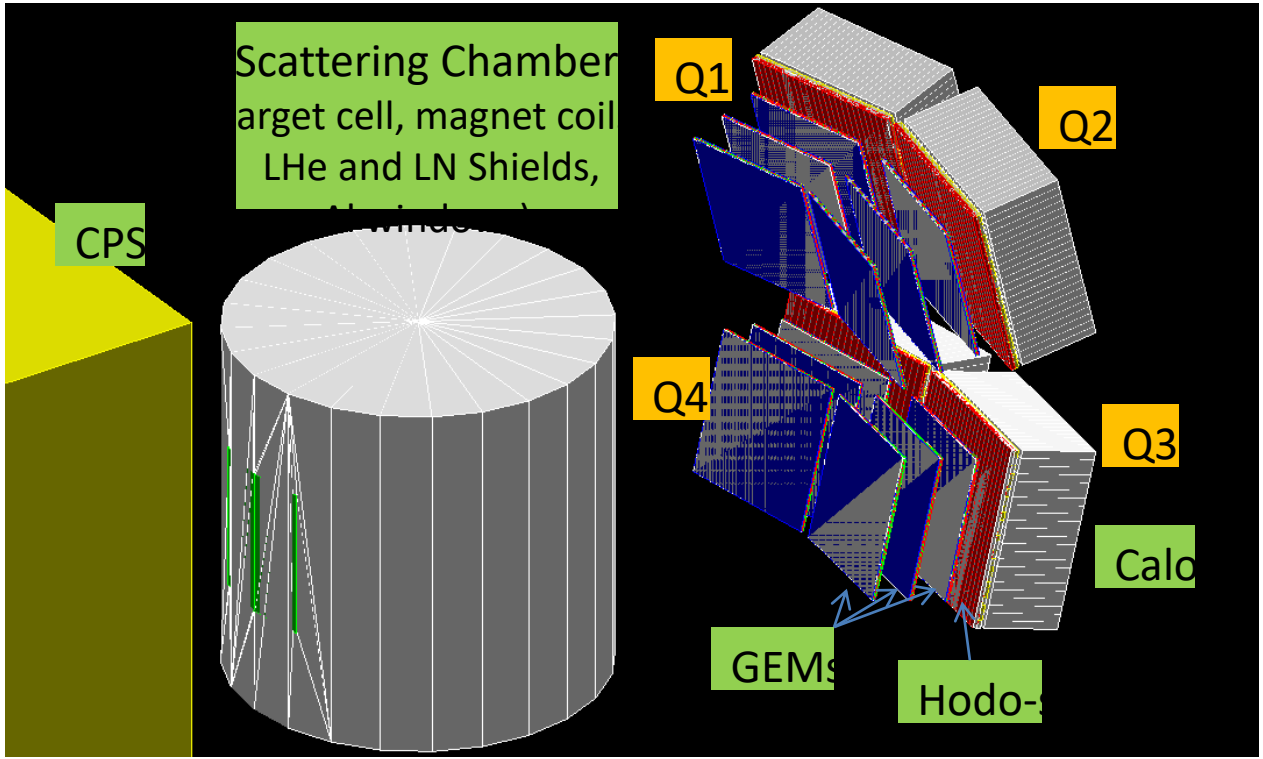
Setup



- Brem. photon beam, 10 MeV – 11 GeV, 2×10^{13} photons/sec.
- Hodo-s, 5 cm thick plastic, passive (no signal).
- No beam pipe.

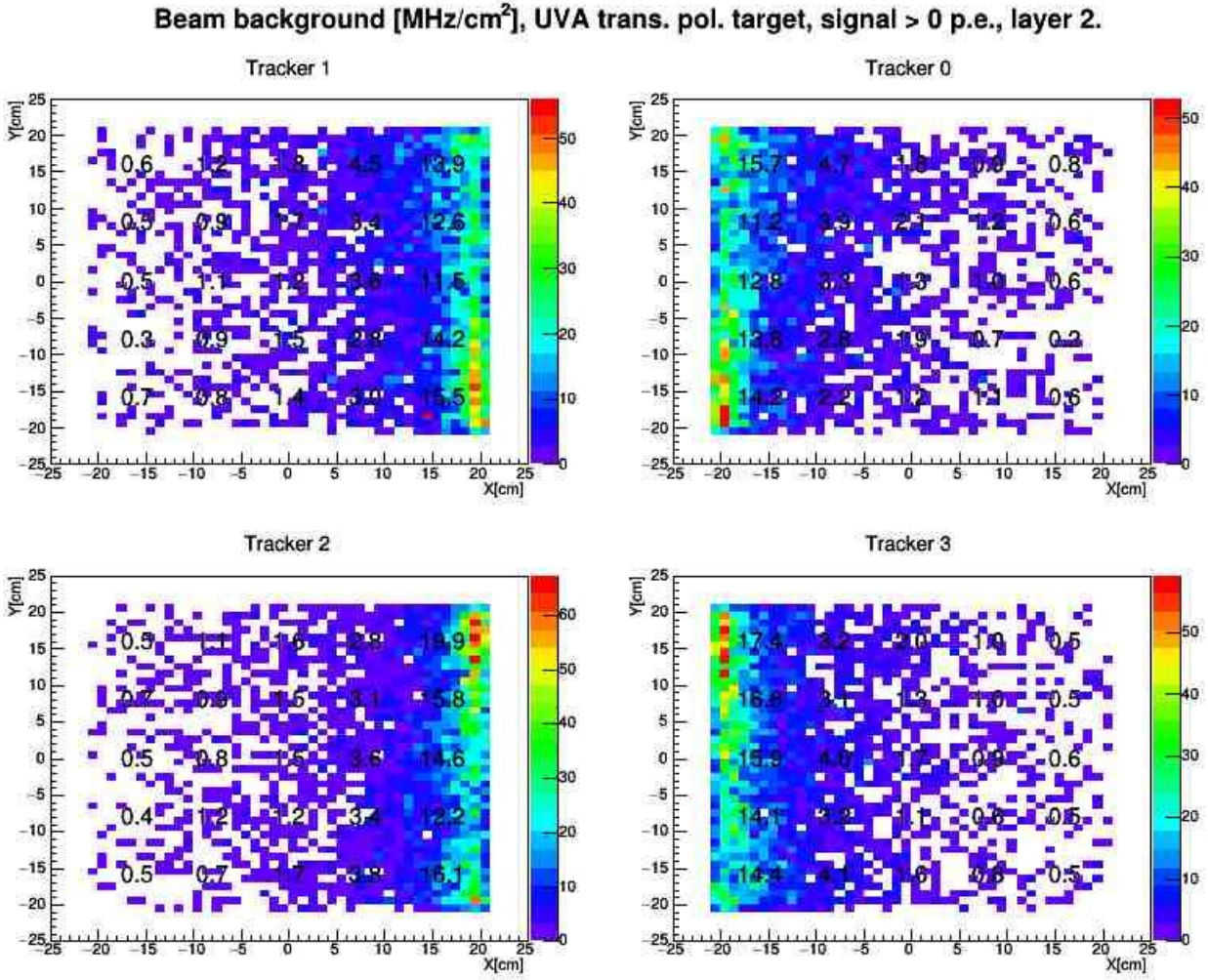
GEM trackers

- Like COMPASS GEM detectors (F.Sauli , NIMA 805 (2016) 2-24)
- 3 mm drift region (70% Ar, 30% CO_2, ρ = 1.7 mg/cm^3)
- Hit signal: energy deposition in drift region

Calorimeters

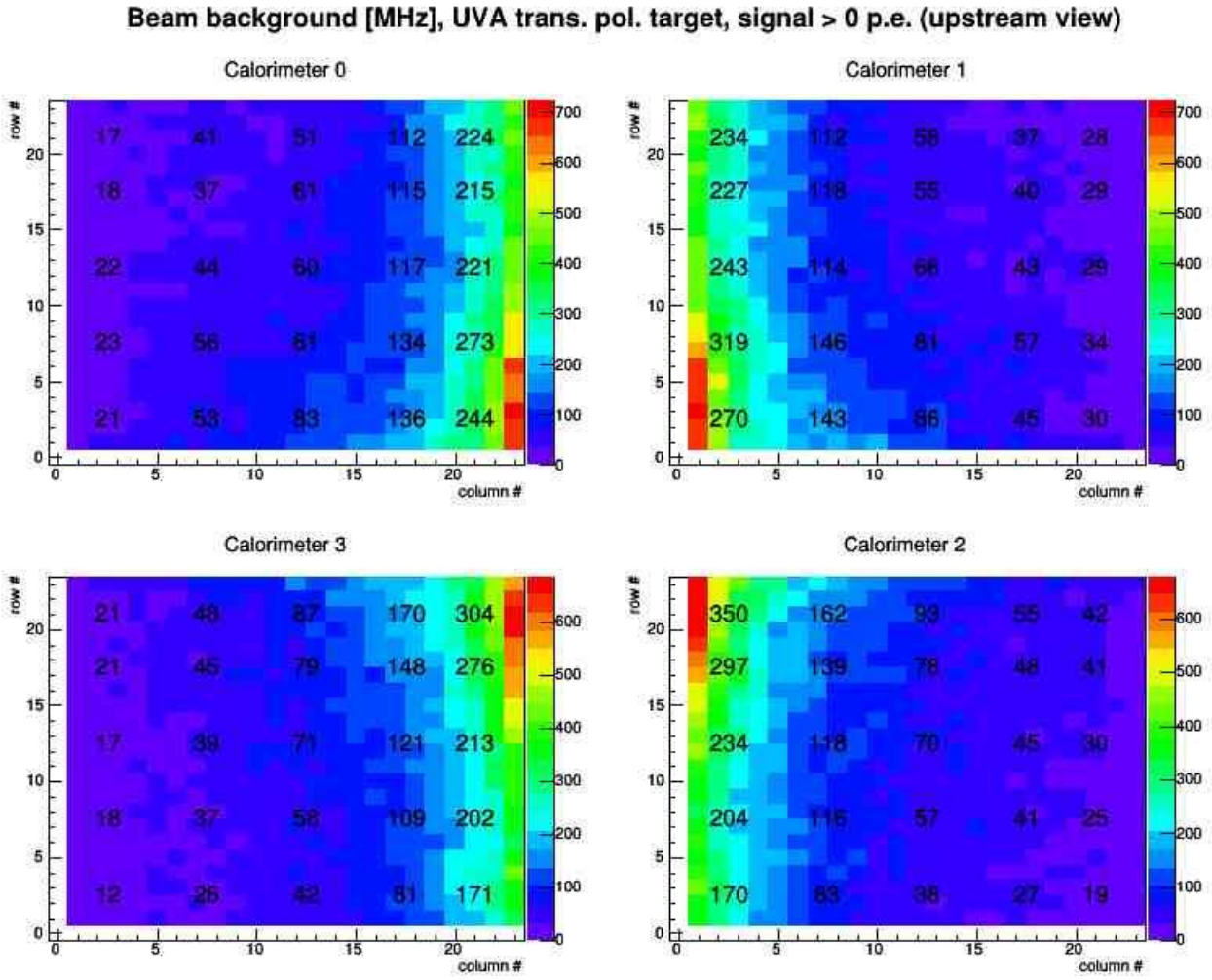
- NPS modules ($PbWO_4$ crystals, WM2000 reflector, R4125 PMT)
- C composite frame, 1 mm thick.
- Optical photon tracking.
- Hit signals in photoelectrons.

GEM Tracker rates



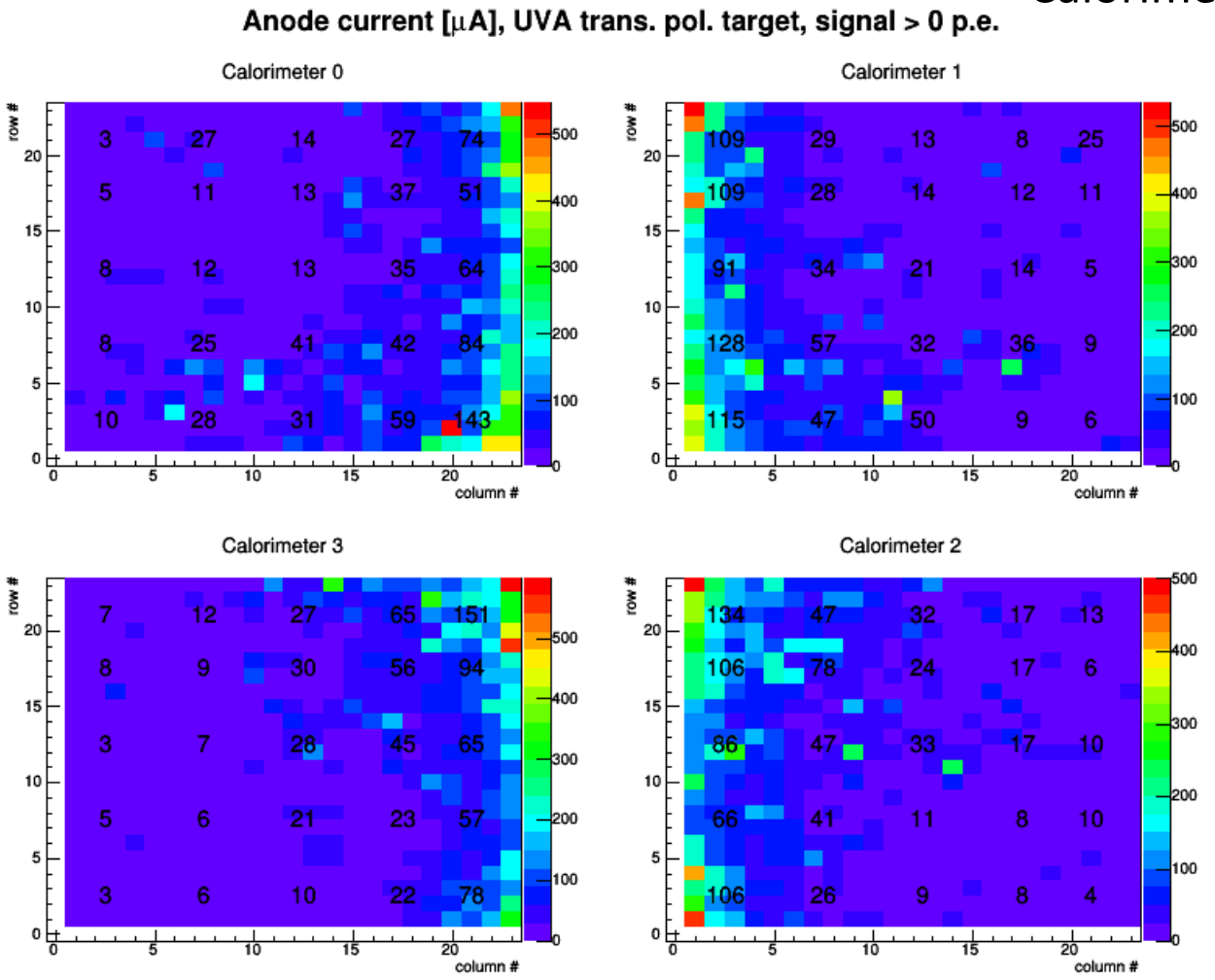
Rate ~1-2 MHz/cm^2 at centers
(can tolerate >10^6 Hz/mm^2 [PDG])
Similar pattern for layers 1 and 3

Calorimeter rates



Rate ~60 – 80 MHz at centers

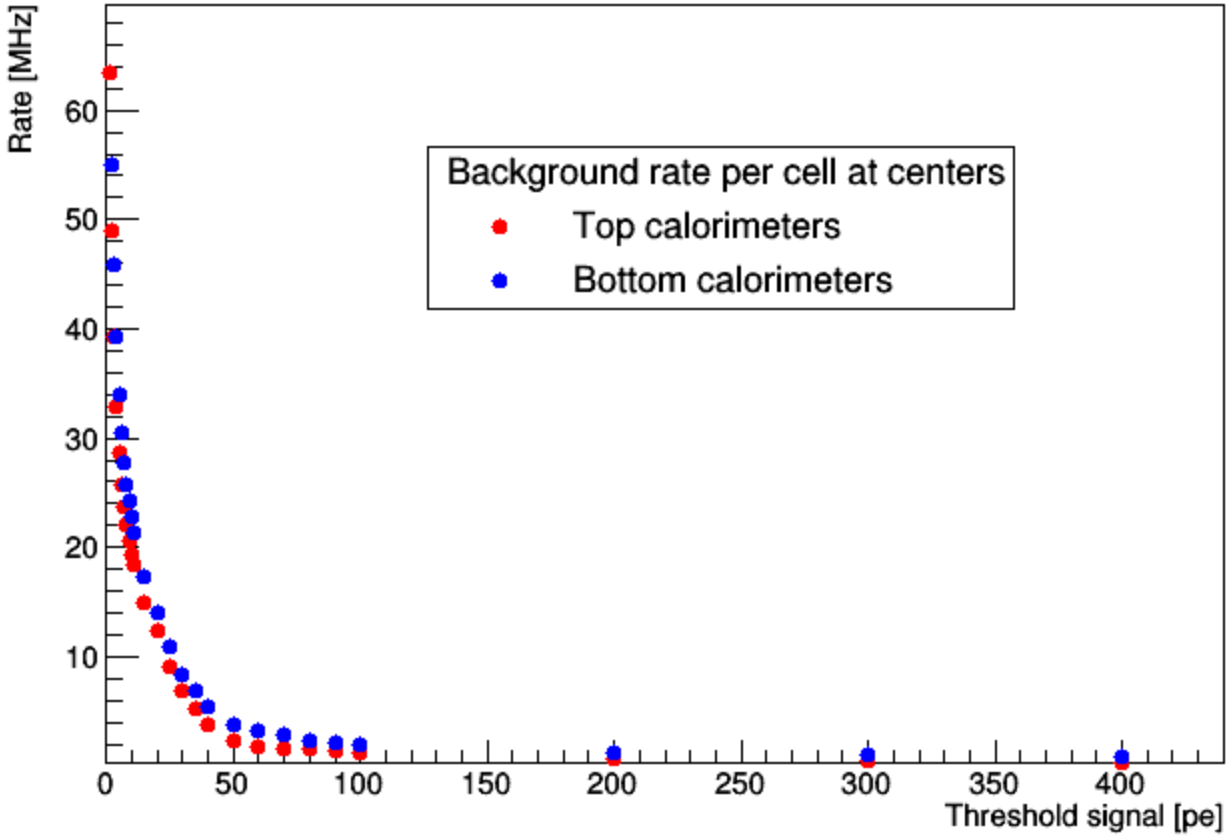
Calorimeters' PMT anode currents



I_A ~10 – 30 μA at centers

Beam exit pipe may affect background rates.
Is it supposed to be same as for NPS?

Back up


Rate [MHz]
60
50
40
30
20
10
0
50
100
150
200
250
300
350
400
Threshold signal [pe]
Background rate per cell at centers
Top calorimeters
Bottom calorimeters