

# Backward Hadronic Calorimeter

Slides for technical meeting with DSC

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Technical meeting with nHCal DSC 4.10.2024

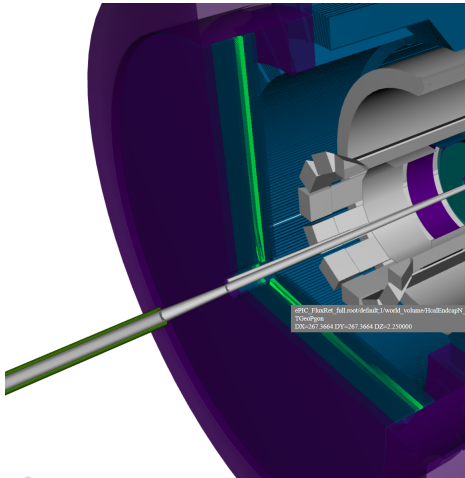


**THE OHIO STATE UNIVERSITY**

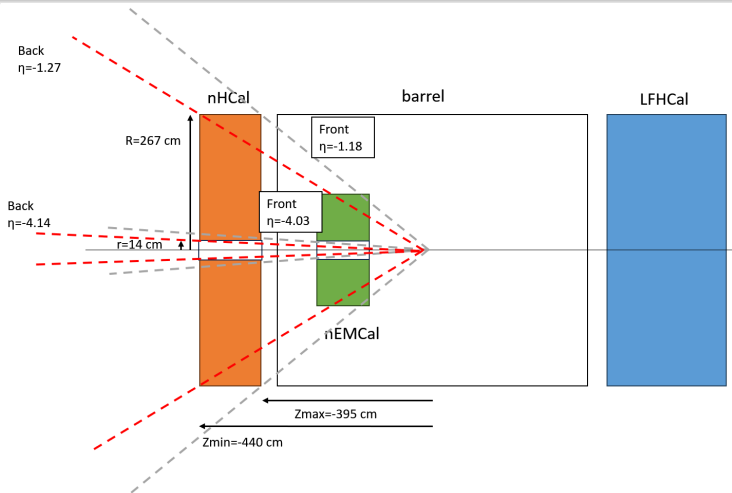
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1 Design

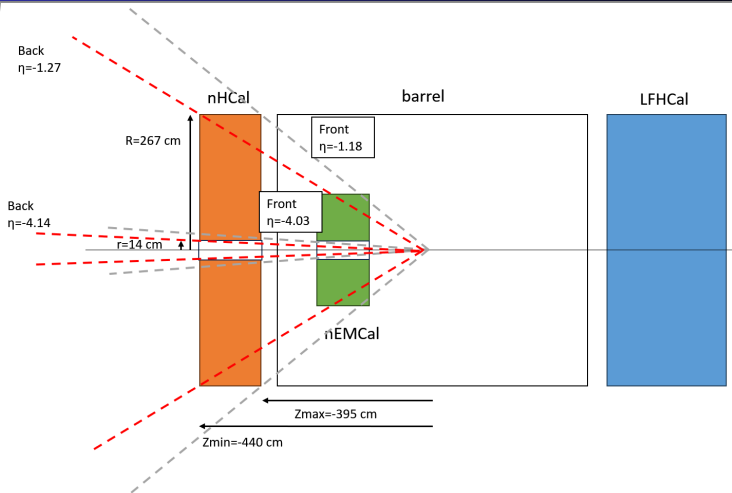
2 Summary



- Sampling calorimeter with 10 alternating layers,  $2.4\lambda^0$ 
  - non-magnetic steel 4 cm (stainless used in simulation)
  - plastic scintillator 4 mm - to be adjusted
- Forward HCal-type geometry with 10 cm  $\times$  10 cm tiles
  - 2352 tiles per layer
- Light collection by SiPM:
  - Candidate (to verify): S14160-1315PS [https://www.hamamatsu.com/eu/en/product/optical-sensors/mppc/mppc\\_array/S14160-1315PS.html](https://www.hamamatsu.com/eu/en/product/optical-sensors/mppc/mppc_array/S14160-1315PS.html)
- Electronics to follow solutions of other calorimetry systems HGCROCv3
- FEEs placed in front of nHCal (need connections)



- Front geometry limit:  $-4.03 < \eta < -1.18$
- Back geometry limit:  $-4.14 < \eta < -1.27$
- Clusters:  $-3.95 < \eta < -1.25$
- MC particles showering in nHCal(with hits):  $-4.16 < \eta < -1.16$



- FEE: HGCROCV3 78 channels (15 bit equivalent from 10 bit ADC and 12 bit TOT via TDC)
  - Norbert Novitzky - needs just connection topology and number of channels
- Services found here  
<https://brookhavenlab.sharepoint.com/:x:/s/EICPublicSharingDocs/EdH38QZE9HpJr1039jn2-q4BbPvrMv7dTFiLV8--atclKw?rttime=r-GCxDnk3EG>

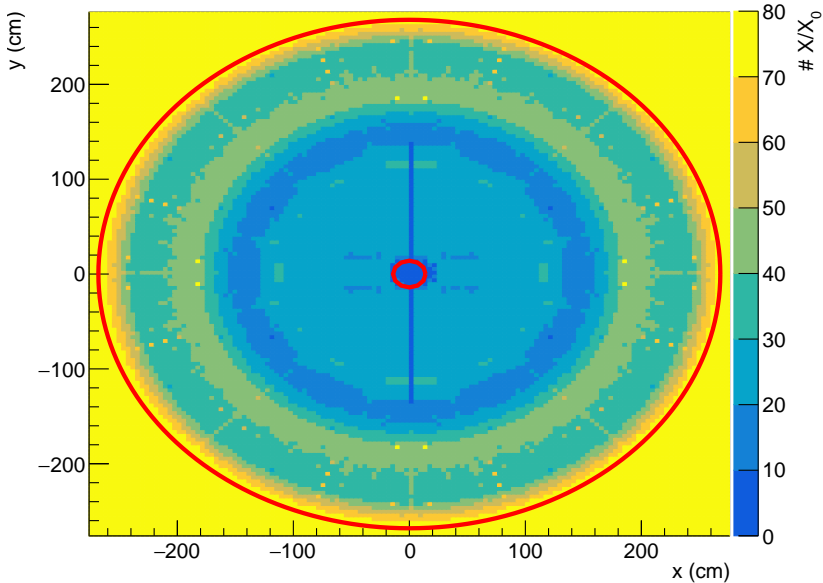
## Conclusions

- Presented technical overview of nHCaI

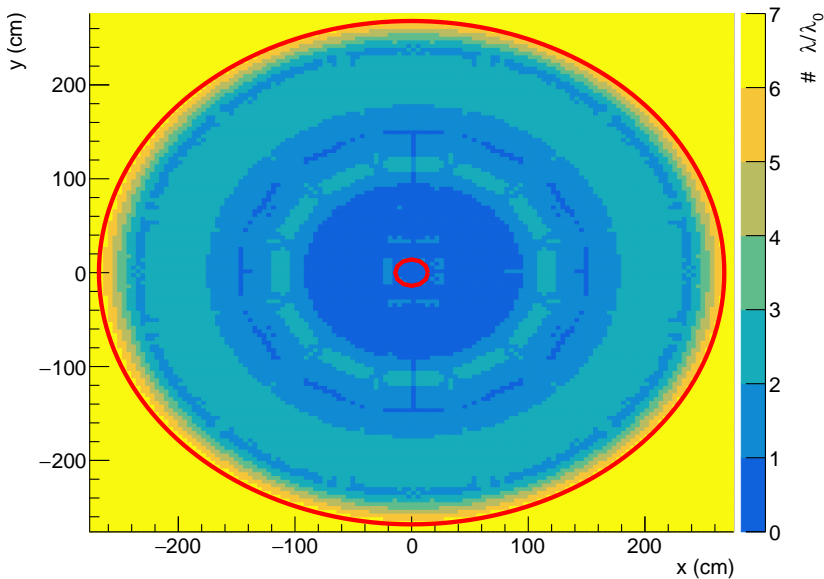
**BACKUP**



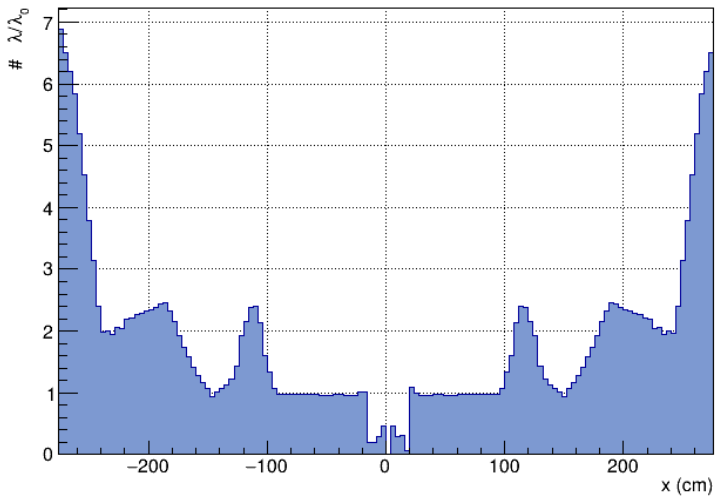
# radiation lengths in front of nHCAL ( $z=-395$  cm)



# interaction lengths in front of nHCAL ( $z=-395$  cm)



ProjectionX of biny=100 [y=-4..0]



# nHCal vs. EEEMCal granularity

