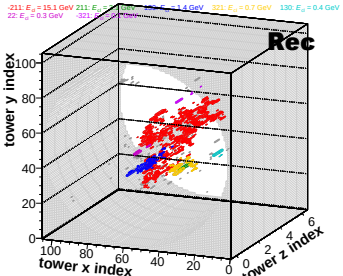
LFHCal & insert: Readout thresholds



LFHCal, Event 30
e-p: 18× 275 GeV, $Q^2 > 100$ GeV

parameter	LFHCal 8M & 4M modules	insert modules
inner x,y (R)	-20 cm $> x > 40$ cm, -30 cm $> y > 30$ cm	$R > 17$ cm
outer R (x,y)	$R < 270$ cm	-20 cm $> x > 40$ cm, -30 cm $> y > 30$ cm
η acceptance	$1.2 < \eta < 3.5$	$3.5 < \eta < 4.4$
tower information		
x, y	5 cm	≈ 3 cm
z (active depth)	130 cm	130 cm
z read-out	≈ 7 cm	≈ 7 cm
interaction lengths	6.5 λ/λ_0	7.5 λ/λ_0
# towers	8704	
# modules		2
8M	1050	
4M	76	
# read-out channels	7 x 8704 = 60,928	23400

- **8M & 4M modules**:
  read out in 7 layers longitudinally (5 or 10 SiPMs summed)
  desirable min measurable tower energy < 0.5 MIP/segment, max. ≈ 1500 MIP/segment
  ideally even just 1 MIP in tile detected
  $\rightarrow$ 565,760 SiPMs, 60,928 read-out channels
- **insert modules**:
  read out every single tile
  desirable min measurable energy < 0.5 MIP/tile , max. ≈ 500 MIP/tile
  23400 SiPMs/tiles & read out channels
- 1 MIP = 600-700MeV in LFHCal tile & 500 MeV in insert tile
- pedestral for summed layers to be validated (only guess right now)
- intrisic noise will dependent on rad. damage

	LFHCal	insert
thresholds [E_{summed}]	0.3-0.35 MeV	0.25 MeV
thresholds [E_{layer}]	0.3-0.35 MeV	0.25 MeV
pedestral [ADC]	layer: 5-10 ADC $\pm$ 2 ADC seg: 50-100 ADC $\pm$ 5-10 ADC?	10 ADC $\pm$ 2 ADC
dark noise rate	< 50 Hz	?