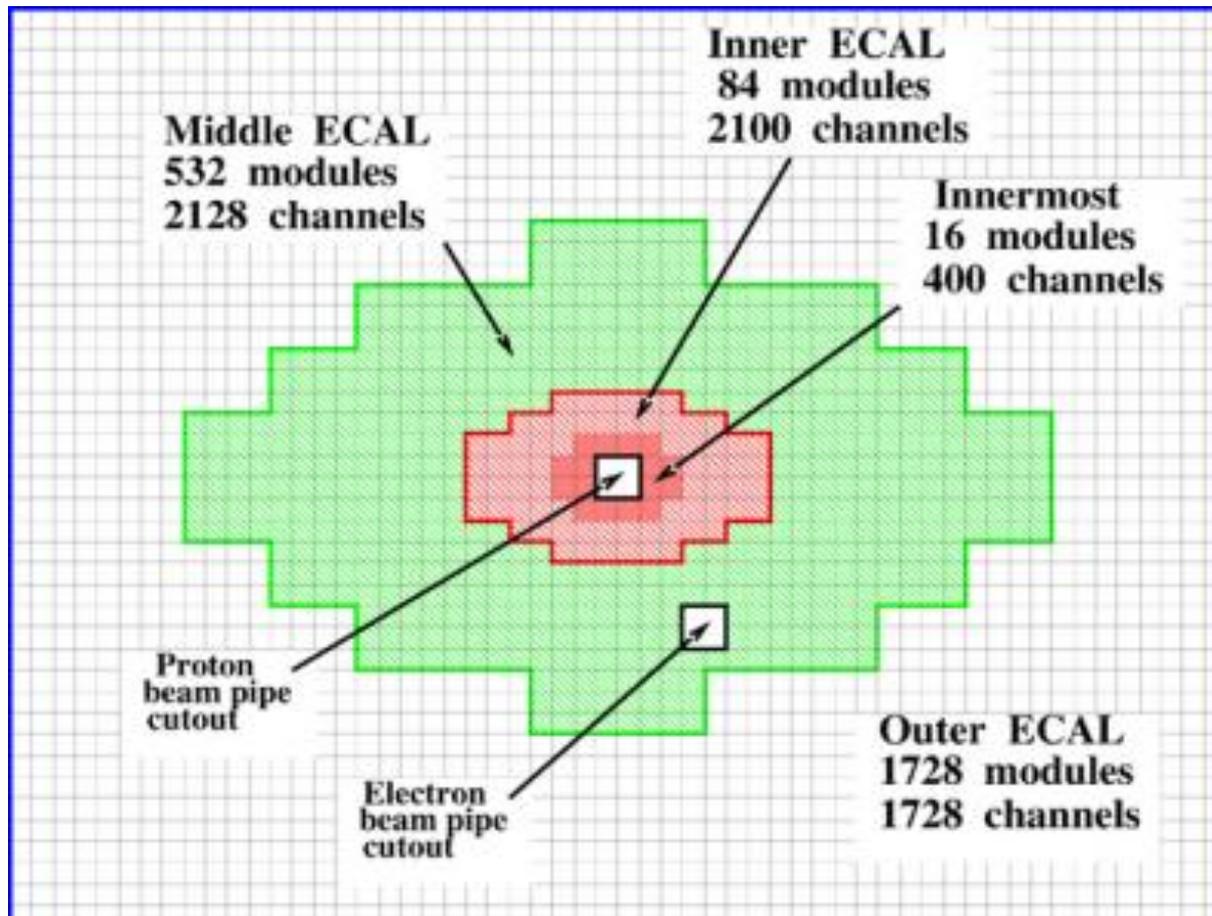


# Update on ECal for GEp5

Mark Jones  
Charles Perdrisat  
Vina Punjabi  
Ed Brash  
Carlos Gayoso

# HERA-B Calorimeter

- Want to use a radiation hard electron “shashlyk” or sampling scintillator/absorber calorimeter like the HERA-B Ecal
- Large calorimeter. Looking into the MIDDLE or OUTER blocks



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- Want to use a radiation hard electron calorimeter like the HERA-B Ecal
- Large calorimeter. Looking into the MIDDLE or OUTER blocks

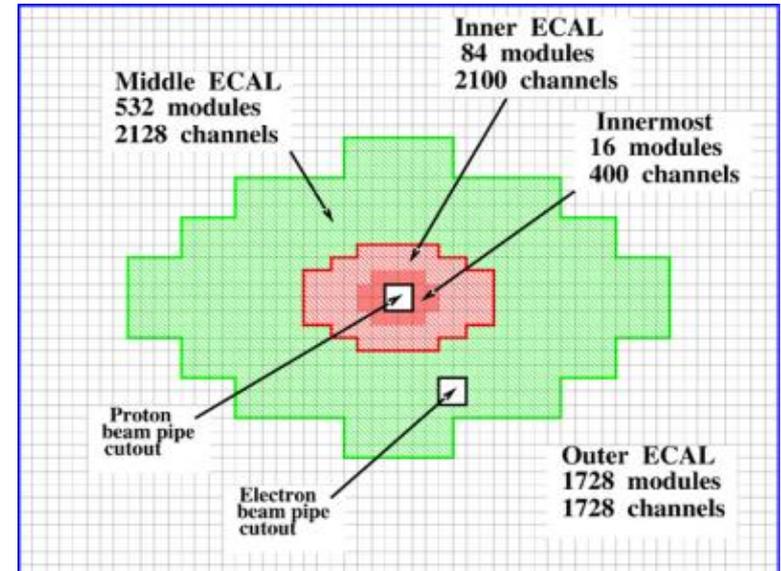


Table 1  
HERA-B ECAL parameters

	INNERMOST/INNER	MIDDLE	OUTER
Channels	2100	2128	1728
Cell size	2.23 cm	5.59 cm	11.18 cm
Absorber	W-Ni-Fe alloy	lead (Pb)	lead (Pb)
Radiation length ( $X_0$ )	0.558 cm	1.675 cm	1.675 cm
Equiv. Molière rad.	1.24 cm	4.15 cm	4.15 cm
Depth	13 cm ( $23X_0$ )	34 cm ( $20X_0$ )	34 cm ( $20X_0$ )
Volume ratio	W:Sc = 2.2 : 1	Pb:Sc = 1 : 2	Pb:Sc = 1 : 2
WLS	Kuraray Y-11	BCF-91A	BCF-91A
Light yield (p.e./GeV)	130	800	1300
PM type	R-5600/FEU68	FEU-84-3	FEU-84-3
LED (wavelength, nm)	Marl (450)	L934SRCB (660)	L934SRCB (660)
Max. radiation dose (kGy/year) at shower-max	50/20	4	1

# HERA-B ECAL MIDDLE module

MIDDLE module with one PMT of the four PMT shown

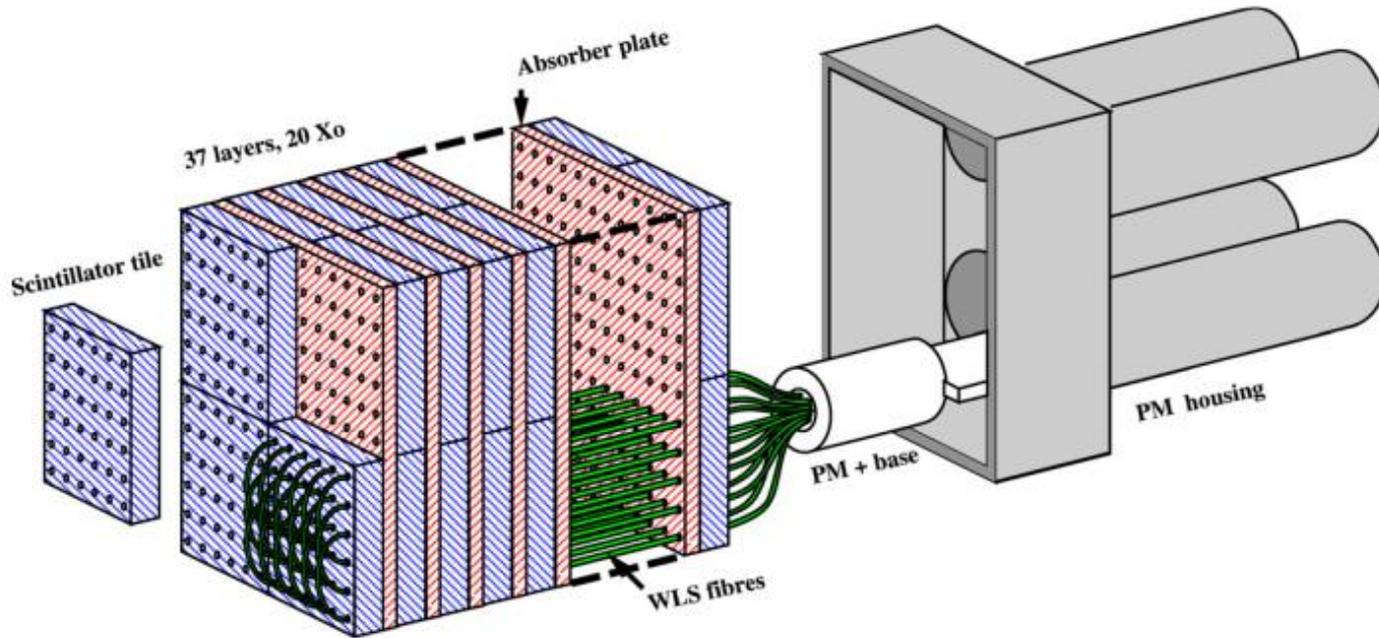


Fig. 4. MIDDLE ECAL module structure.

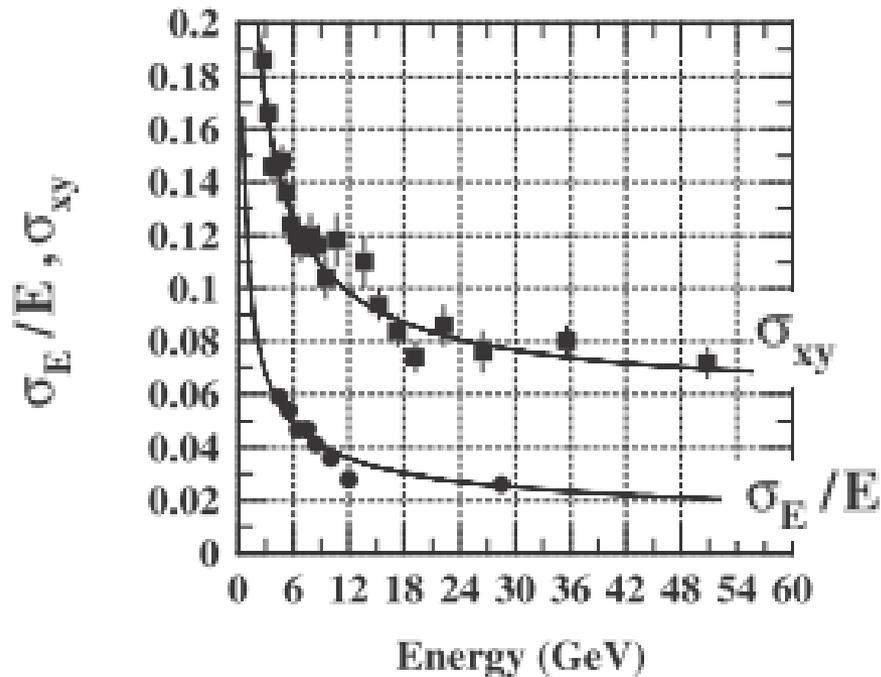
The OUTER ECAL module has the same transverse size but not segmented with only one PMT

# HERA-B Ecal performance

MIDDLE

$$\frac{\sigma_E}{E} (\%) = 11.8(0.2)/\sqrt{E} \oplus 1.4(0.1)$$

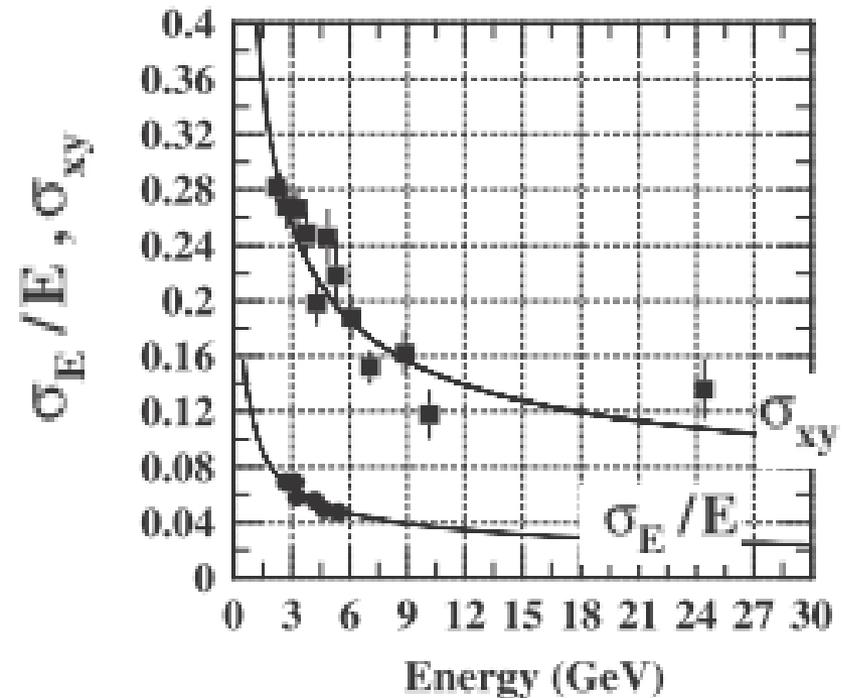
$$\sigma_{xy} (\text{cm}) = 1.37(0.03)/\sqrt{E} \oplus 0.28(0.02)$$



OUTER

$$\frac{\sigma_E}{E} (\%) = 10.8(0.1)/\sqrt{E} \oplus 1.4(0.2)$$

$$\sigma_{xy} (\text{cm}) = 2.17(0.09)/\sqrt{E} \oplus 0.28(0.15)$$



# Progress

- Charles and Vina meet with Zaitsev in Russia to discuss the possibility on obtaining HERA-B calorimeter MIDDLE or OUTER modules.
  - One problem is that HERA-B Ecal is backup plan if funding for new Ecal for the CBM experiment at FAIR is not funded
  - Expressed concern about the aging of the modules
  - Agreed to loan 10 modules that we could study at JLab
- Carlos is presently at DESY and has packed the 10 modules and they are being shipped today.
- Arranged for space in the TEDF building to setup tests.

# Upcoming Efforts

- Dec 1<sup>st</sup> , 10 modules in the TEDF at JLab. Begin testing.
- Check further into pricing for new modules.
- By April 2013 should understand the shape of the HERA-B modules and decide whether they could be used.
- Sergey will work on the DAQ and getting the MQT system working
- Planning to put together a funding request for the ECAL.