

Updates Alt sPHENIX Spacal Variations

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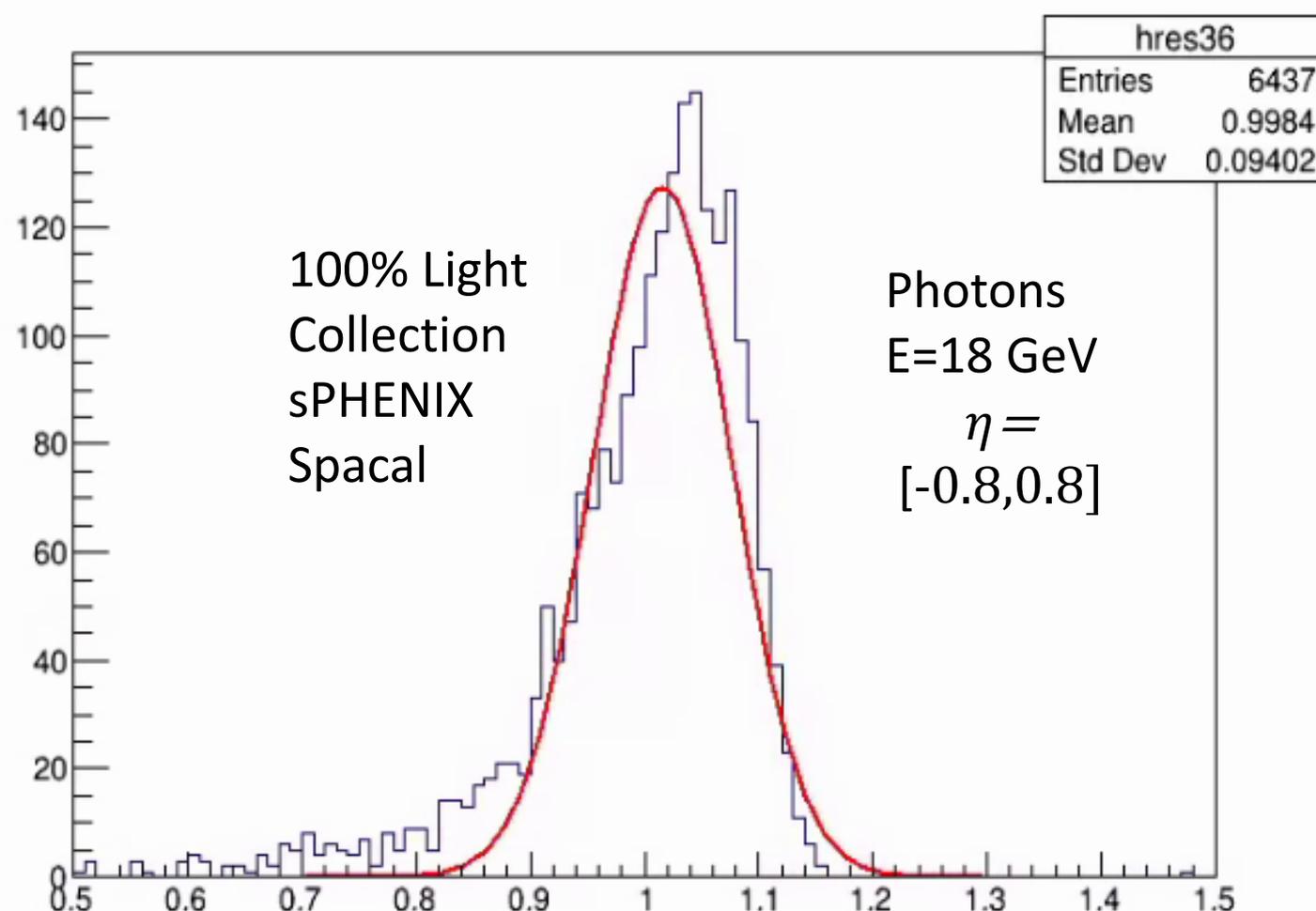
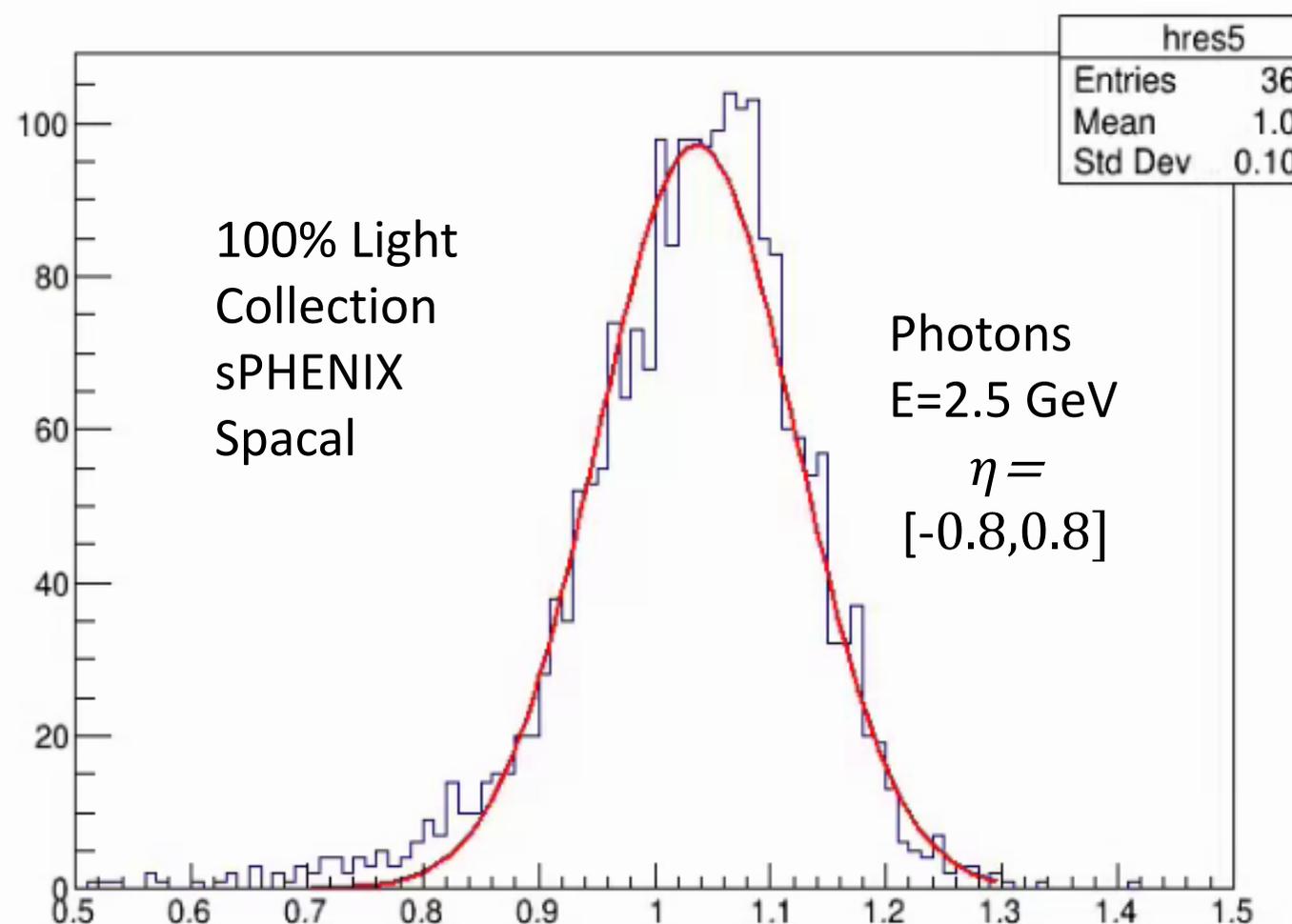
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ECCE Calorimetry WG Meeting



Perfect Light Collection: Intro Example Reso Fits

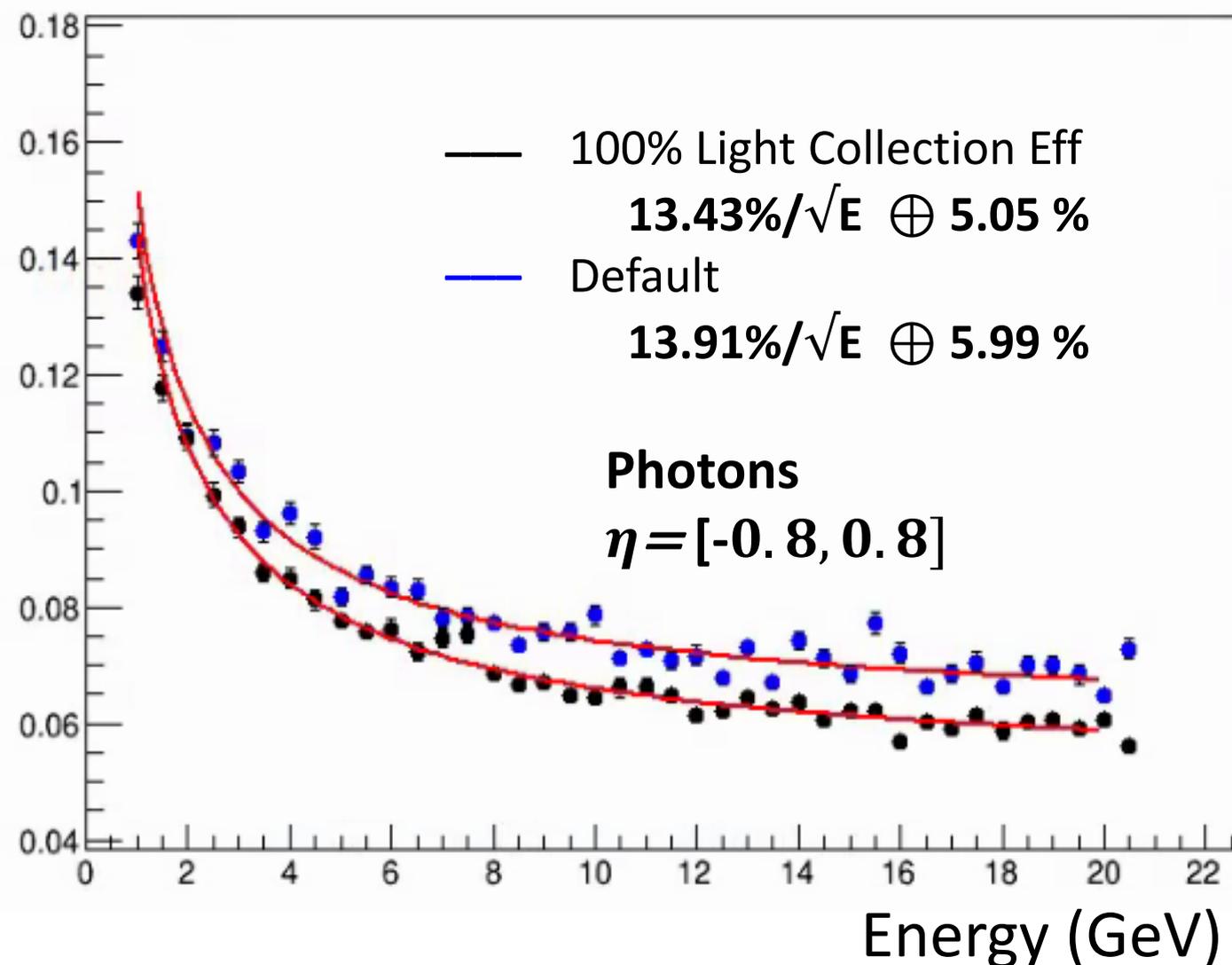
- As with last week Changed the light collection percentage of the sPHENIX Spacal to size of improvement of perfect (100%) light collection from current (~23%?)
- Currently done w/ sPHENIX build, macros. Energy Reso Bin Fits aren't perfectly optimized



Perfect Light Collection: Small Improvement ?

- Higher statistics look over the whole detector since last week comparing standard (Default) sphenix vs. Perfect
- Pt bin fits might be improveable...
- But difference seems small with these fits (0.5% sqrt(E) and 1% constant improvements)

Resolution



Alt Fiber Density

- Preparing the ECCE simulation for this row from YR table pg 490

490

11.3. ELECTROMAGNETIC CALORIMETRY

#	Type	samp- ling, mm	f_{samp}	X_0 mm	R_M mm	λ_I mm	cell mm ²	$\frac{X}{X_0}$	ΔZ cm	$\sigma_E/E, \%$	
										α	β
1	W/ScFi**	∅0.47 ScFi W powd.	2%	7.0	19	200	25 ²	20	30	2.5	13
2	PbWO ₄ ***	-	-	8.9	19.6	203	20 ²	22.5	35	1.0	2.5
3	Shashlyk***	0.75 W/Cu ^a 1.5 Sc	16%	12.4	26	250	25 ²	20	40	1.6	6.3
4	W/ScFi** with PMT	0.59 ² ScFi W powd.	12%	13	28	280	25 ²	20	43	1.7	7.1
5	Shashlyk***	0.8 Pb 1.55 Sc	20%	16.4	35	520	40 ²	20	48	1.5	6
6	TF1 Pb glass***	-	-	28	37	380	40 ²	20	71	1.0	5-6
7	Sc. glass ^b	-	-	26	35	400	40 ²	20	67	1.0	3-4

*** Mature technology, well understood. used in several experiments

** New technology, proven in test beams , in production for experiments

* Technology under development, not fully proven in test beams

a Material 80% W + 20% Cu by volume, $X_0=4.1$ mm

b The parameters of scintillating glass are tentative, see Section 11.3.3.

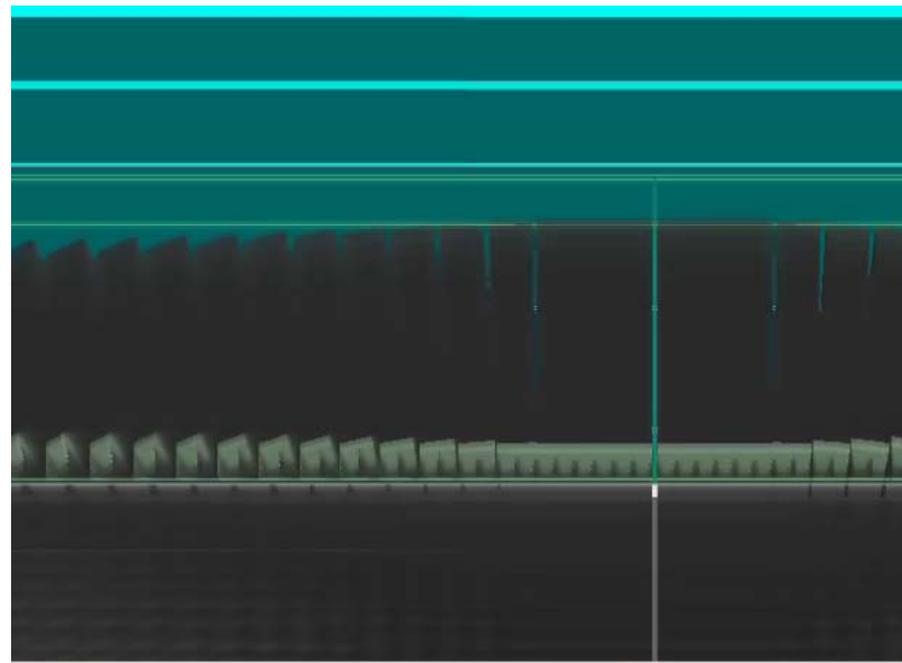
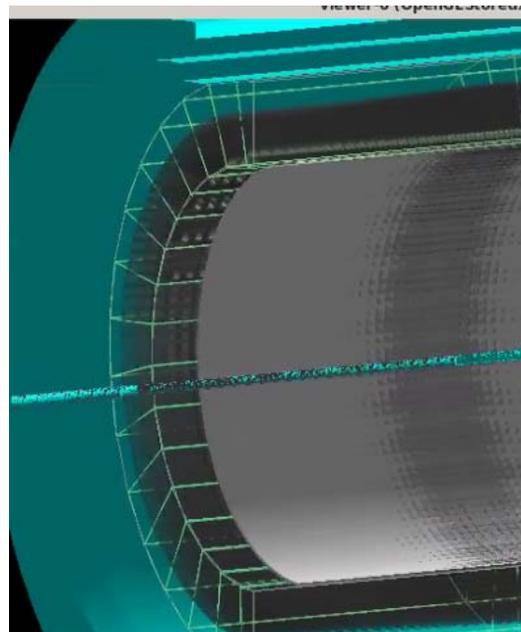
Assuming this just means larger diameter fibers (square?) and Same W powder properties

Check w/ Craig?

Larger Rad Lengh means blocks need extended

Alt Fiber Density: Probably very close

- Currently have successfully extended blocks/fibers sufficiently in simulation
 - tested several ways -- drew fibers for couple towers – long time to draw whole det fibers!
 - Kept same start radius (~95cm) as default sPHENIX spacial extended into (removed) iHCal region for this study.
- Also have new wider fiber radius in the simulation...
 - ...But currently still working on placing more fibers (first change of fiber girth resulted in less fibers being placed)
- I think this last part should be easy to be fix...so basically should have results soon.



fibers

