FCC Napoli – TB analysis

WEEKLY REPORT - 20 NOV. 2024

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BGO – runs [171;201] – CH1 preamp 18

 Observed difference in slopes between descending and ascending branches of U plot.
Possible reason its asymmetry.

■ For calibration scopes: considering only parameters related to the descending branch of U plot, i.e. from 0° to 90°



BSO – runs [246;262] – CH1 preamp 18

Less difference in slopes between descending and ascending branches of U plot: this U plot is more symmetric

■ For calibration scopes: considering only parameters related to the descending branch of U plot, i.e. from 0° to 90°



Bias

■ Runs with muons for PWO only at small angles: peak in deposit observed at 183° instead 180° → necessary to identify any geometrical bias

□ Tighter angle scan in the vicinity of 0° and 180° to better study the trend of the U plot

Low sensitivity in **plateau region**: inverted MC function only in branches

Gaussian fit to bias distribution:

$$\hat{b}_{PWO} = -1.5 \pm 0.7$$

 $\hat{\sigma}_{PWO} = 1.4 \pm 0.6$



PWO – runs [306;316] – CH1 preamp 28



Simulated energy deposit [MeV]

PWO – runs [306;316] – CH1 preamp 28

Without bias correction

■ For calibration scopes: considering only parameters related to the ascending branch of U plot, i.e. from **175° to 177°**





From SiPM calibration:

Summary SiPM 3x3 Calibration

[n] —	mV
$[p_1] -$	phe

<u>SiPM</u>	Gain	Gain amplitude conversion	Method	$p_0 + error$	$p_1 + error$ [mV/ n_{pe}]	τ + error(ns)	conversion factor charge $\tau(1 - 0.0497)$
3x3	28	25,12	В	-1,4±0,4	1,236±0,002	46,9±0,2	44,61
3x3	24	15,85	В	-0,9±0,2	0,785±0,002	45,2±0,2	42,93
3x3	18	7,94	В	-0,3±0,1	0,401±0,002	46,3±0,6	44,02
3x3	Passive Preamp		В	0,064±0,005	0,0425±0,0009	18,3±0,3	17,41

PhotoElectrons vs MeV

Considering only one branch of U plots

Crystal	p1 (phe/MeV)		
Crystar	Gain 18	Gain 28	
BGO	9,0 +/- 0,1	-	
BSO	2,08 +/- 0,03	-	Data from 0 to 90
PWO	-	0,56 +/- 0,06	Data from 175° to 177°, w
		0,70 +/- 0,06	Data from 175° to 177°, w

Beam spot

□ Wire chamber data from *"/eos/project/d/drd6-storage/maxicc/CERNTBJuly2024/data/ntu_v0"*

Access permission only if joined the group <u>drd6-maxicc</u>

Two runs at the following <u>public link</u>: run 6598 mu+120 GeV, 6583 e+ 10 GeV.

□ In the root files there are 1D histograms (h_beamX, h_beamY) with the beam profile. Alternatively, the tree variables called t_beamX and t_beamY can be read.

No info about divergence (because we had a single wire chamber), except what we can try to understand with the data itself but it's not much because we don't know the spatial resolution of the wire chamber.

No info about the beam energy resolution: try to contact beam experts or other calorimetry users in July. It can be assumed under 3%. They all can be considered second order effects in the simulation at the current stage.

Beam spot

□Mu+120GeV



Beam spot

e+10GeV

