The express analysis of the cosmic muon tests

Shashlyk module #10
(w/o paper between the scintillator plates and the lead plates)

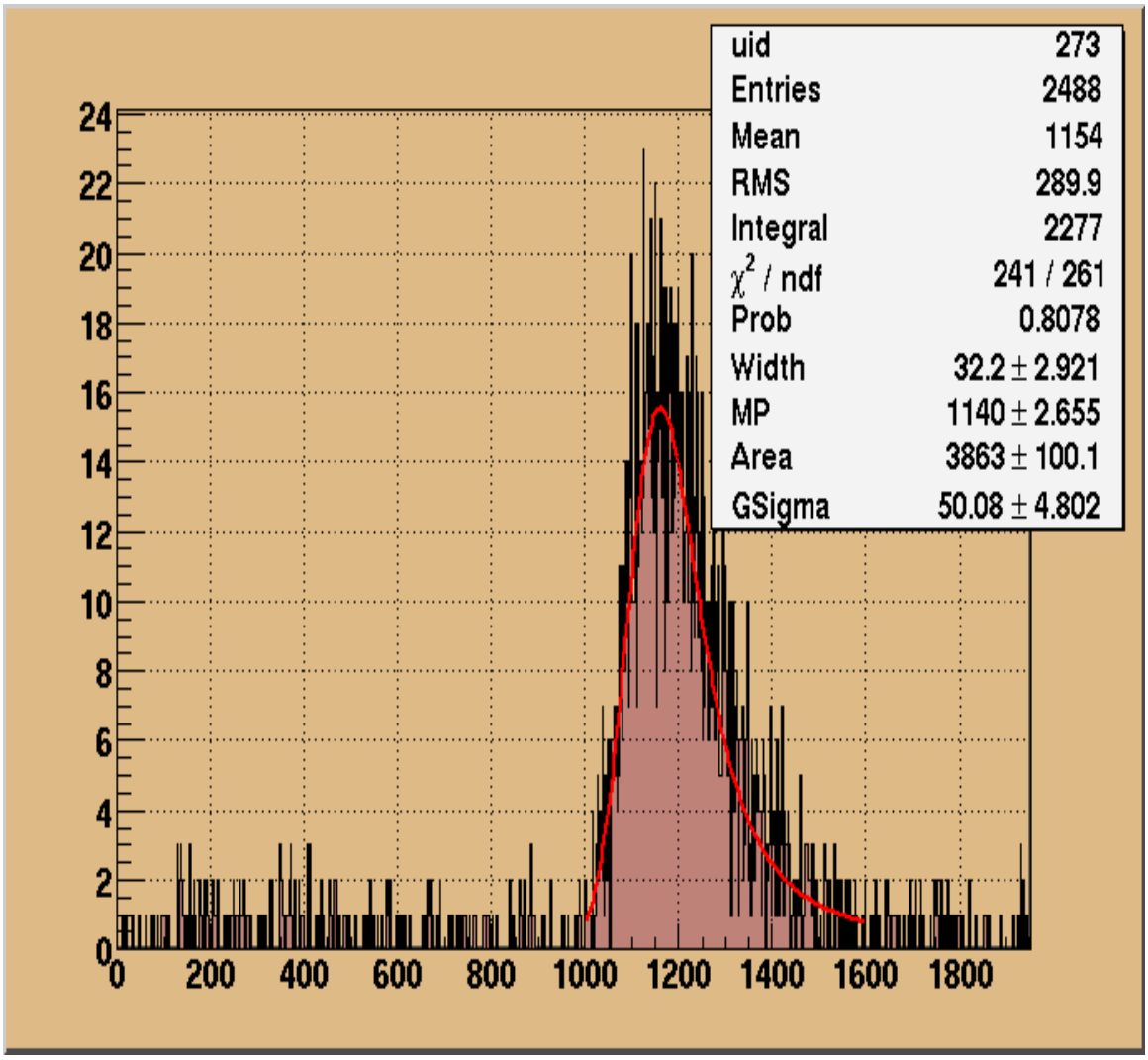


Fig. 1. The light yield of Shashlyk module #10. The module is in a vertical position. One QDC bin is 1.47 photoelectrons. A peak position is 1677 ± 4 photoelectrons.

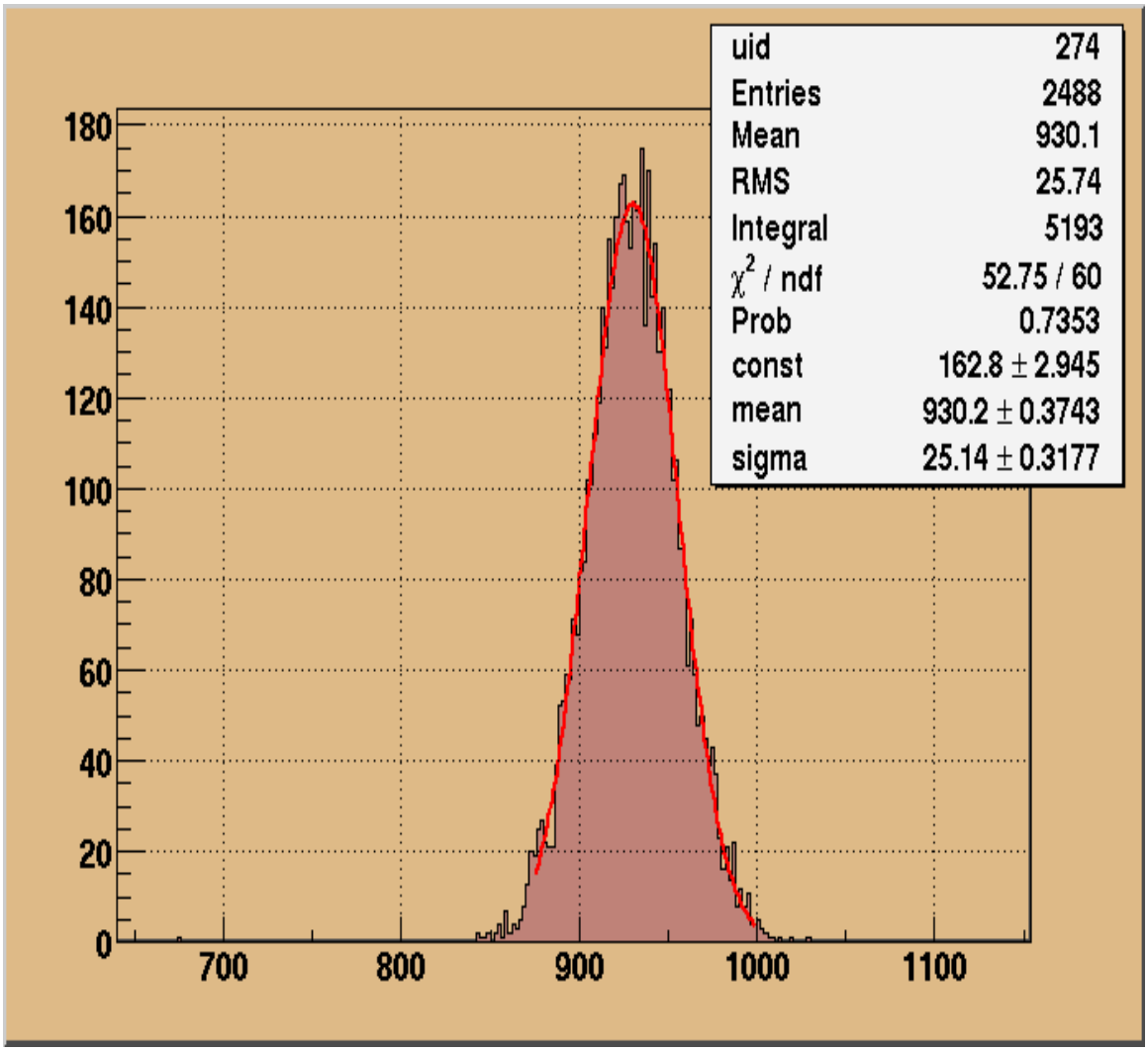


Fig 2. Calibration of the QDC scale by the light emitting diode (LED). The light yield in a peak position is 1369 photoelectrons ($[930.2/25.14]^2$). One QDC bin is 1.47 photoelectrons.

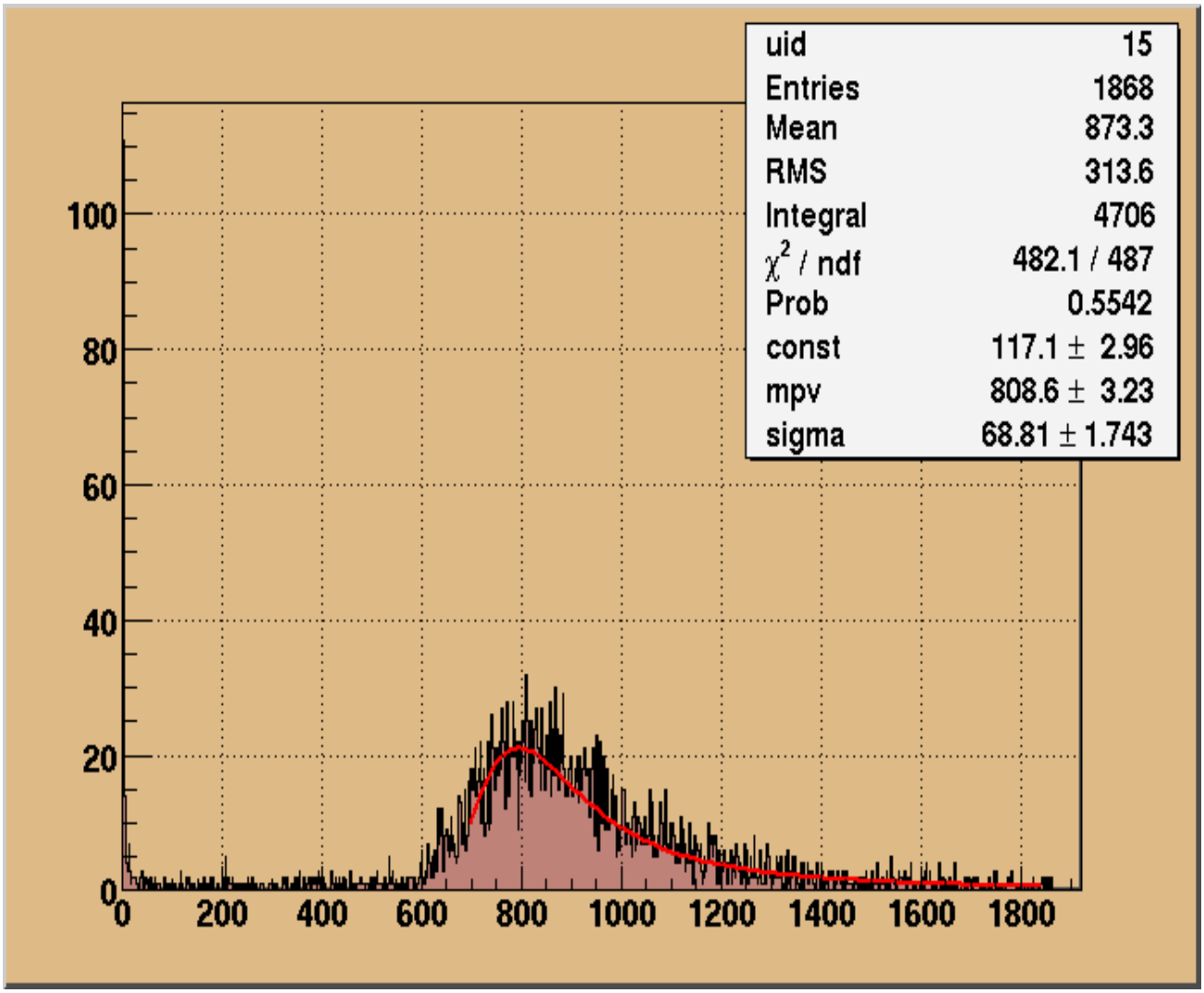


Fig. 3. The light yield of Shashlyk module #10. The module is in a horizontal position. One QDC bin is 0.37 photoelectrons. A peak position is 299 ± 3 photoelectrons.

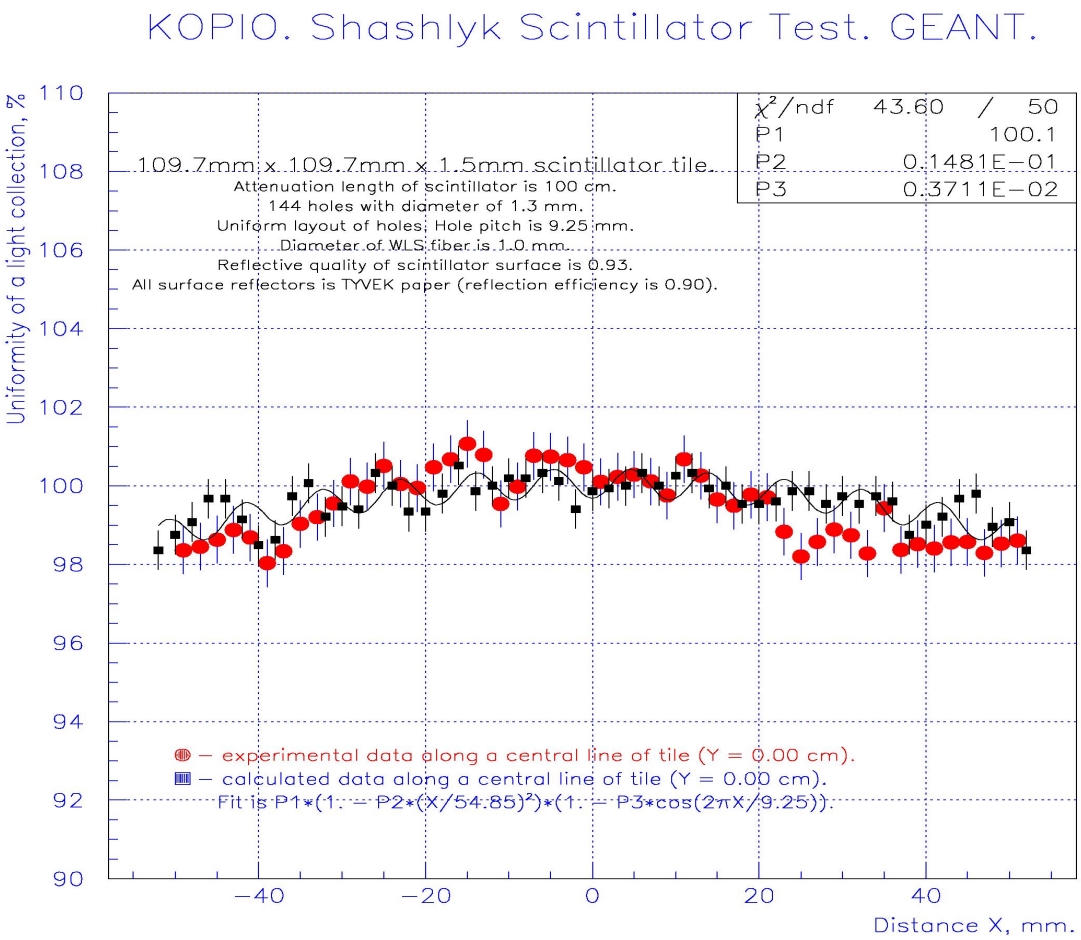


Fig. 4. The nonuniformity of light collection in Shashlyk module versus the position of the radioactive source. The distance is measured from the center of tile. The radioactive source had a 3 mm diameter collimator. Red circles are experimental data, blue squares and line are showing the GEANT/OPTIC simulation. All surface reflectors are TYVEK paper (reflection efficiency is 0.90). Optical parameters of scintillator tile are shown in picture.

Light yield of the 20 KOPIO modules

- **10 Shashlyk modules with a TYVEK papers between a scintillator plates and a lead plates.**
- **10 Shashlyk modules without any papers between a scintillator plates and a lead plates.**
- **All modules are in a horizontal position, i.e. the cosmic muons have passed across modules.**
- **One PMT (EMI 9903b) for all measurements.**
  <LY> = (290±18) p. e.

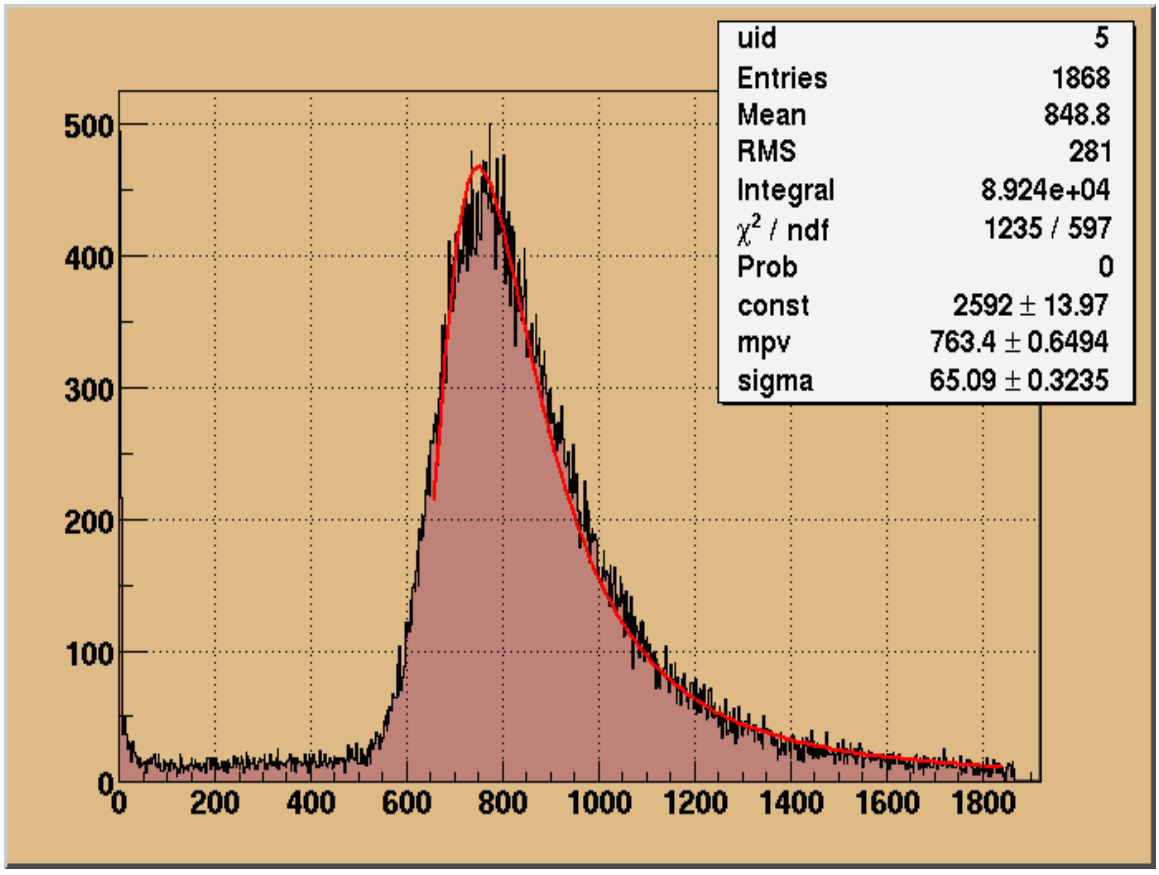


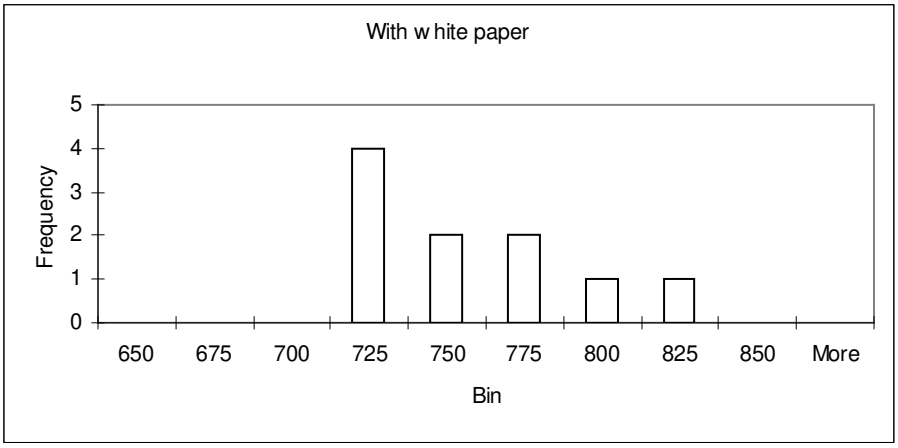
Fig. 1. A typical response of the Shashlyk module to the cosmic muons, passing across module.

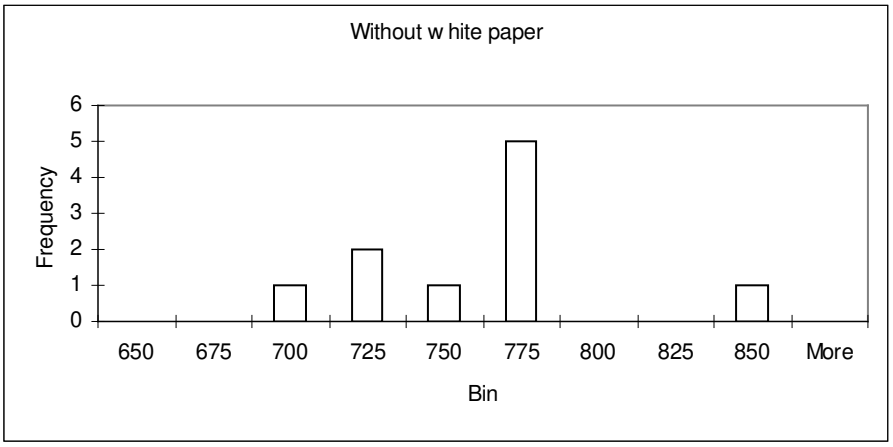
	Mean	Statistics	Note
mod #1	742,1±3,9	45000	white paper
mod #2	708,4±6,5	20000	white paper
mod #3	756,2±7,6	9200	white paper
mod #4	701,2±4,1	100000	white paper
mod #5	761,0±6,5	90000	white paper
mod #6	718,4±7,0	95000	white paper
mod #7	722,6±6,7	13300	white paper
mod #8	734,5±5,7	81000	white paper
mod #9	775,2±6,7	26000	white paper
mod #10	815,5±7,1	10000	white paper
Minimum	701,2		
Maximum	815,5		
Mean	743,5	489500	
Standard Deviation	34,7		
Stand Dev/ Mean	0,05		

	Mean	Statistics	Note
mod #11	684,9±6,7	10500	no white paper
mod #12	773,7±6,8	29000	no white paper
mod #13	751,2±7,0	7700	no white paper
mod #14	738,6±7,4	8800	no white paper
mod #15	763,9±7,3	9300	no white paper
mod #16	711,0±7,2	10200	no white paper
mod #17	833,0±10,5	6400	no white paper
mod #18	758,2±7,6	9300	no white paper
mod #19	724,7±7,5	7100	no white paper
mod #20	754,5±7,3	9800	no white paper
Minimum	684,9		
Maximum	833		
Mean	749,4	108100	
Standard Deviation	39,8		
Stand Dev/ Mean	0,05		

Mean	746,4		All modules
Standard Deviation	36,5		All modules
Minimum	684,9		All modules
Maximum	833		All modules
Stand Dev/ Mean	**0,05**		**All modules**

Tab. 1. The light yield of the 20 KOPIO modules.





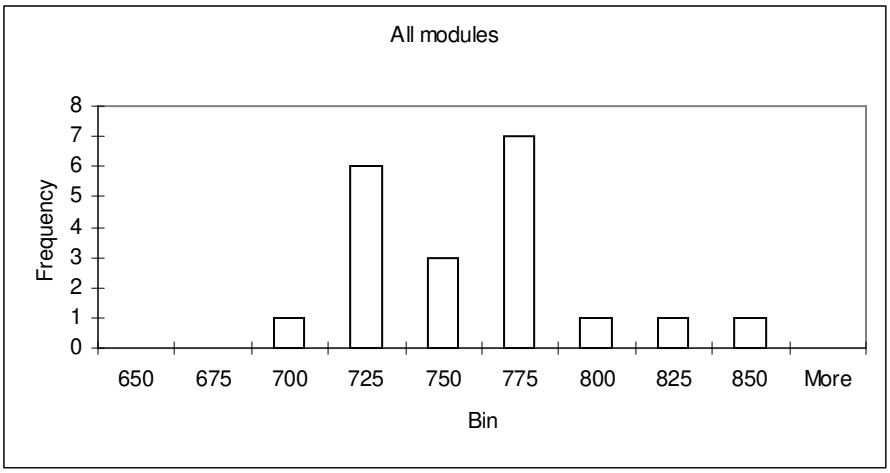


Fig. 2. The light yield of the 20 KOPIO modules.