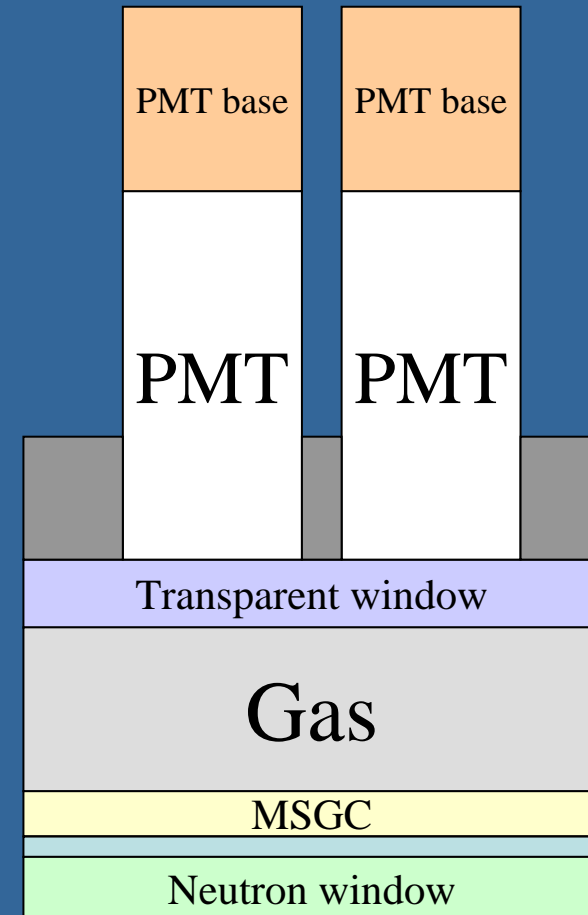
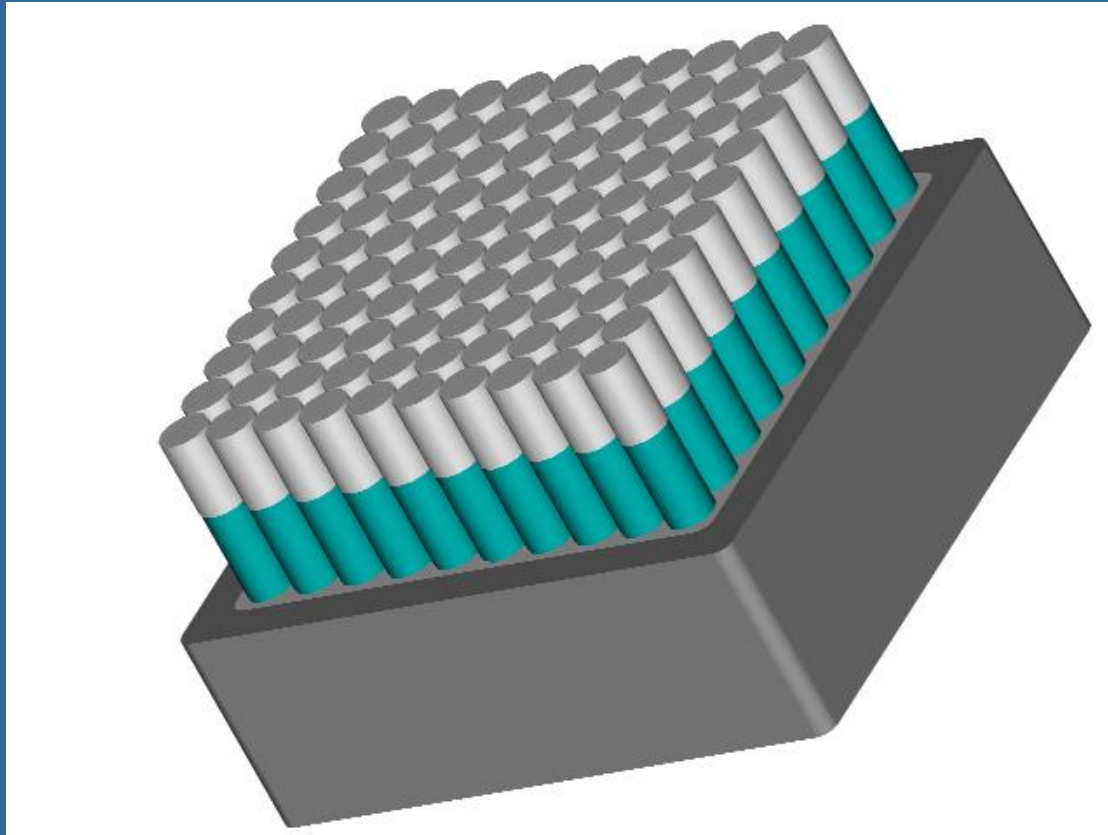


Measurement of PMT photocathode uniformity

L. Pereira¹, A. Morozov¹, F. Fraga¹

¹ LIP-Coimbra, Departamento de Física, Universidade de Coimbra, 3004-516 Coimbra, Portugal.

Anger camera for neutron detection

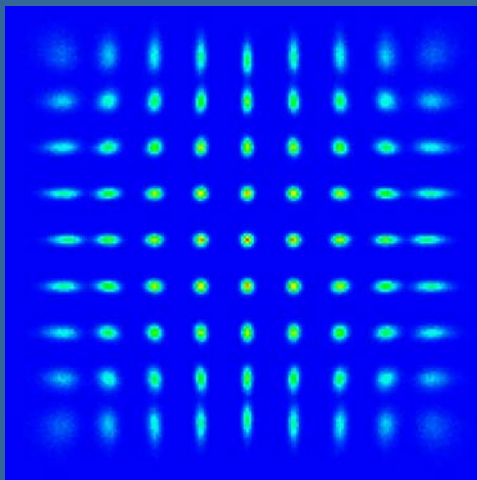


MSGC: microstrip gas chamber

Simulations, E. M. Schooneveld, Azores meeting

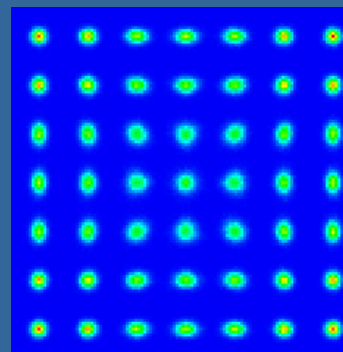
- 5 mm absorption gap
- $2E5$ photons/neutron

2x2, 30 mm \varnothing PMT



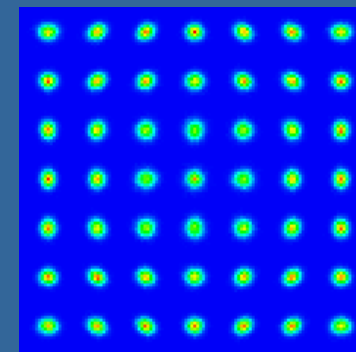
- FWHM: $<1.5\text{mm}$

3x3, 19 mm \varnothing



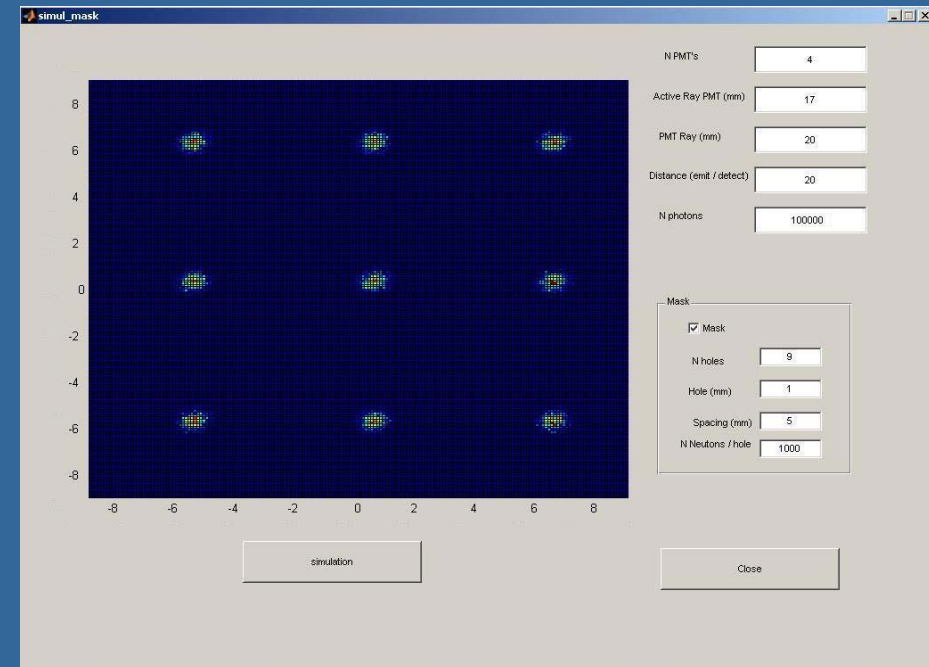
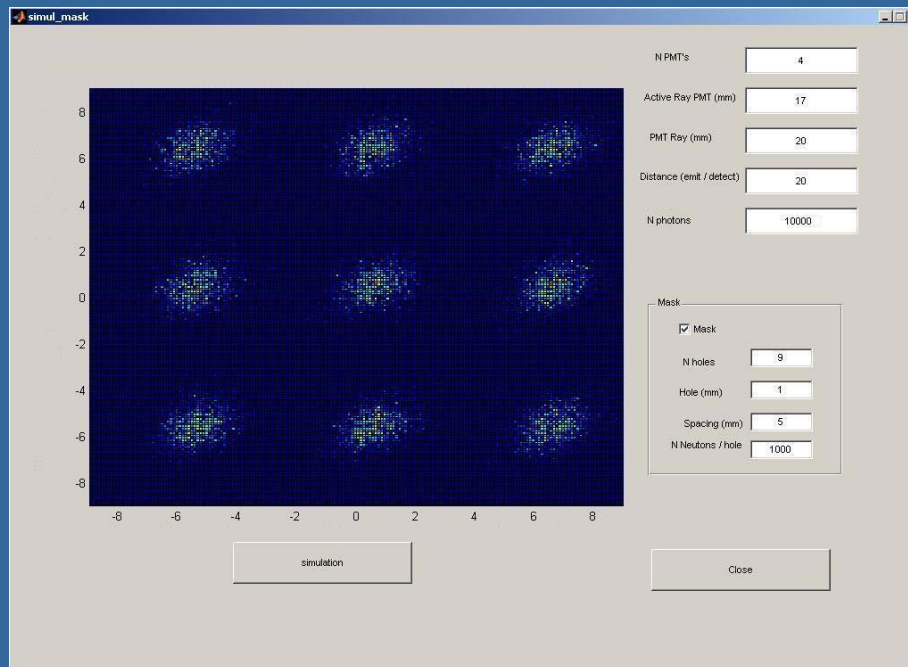
$<1.3\text{mm}$

hex, 19 mm \varnothing



$<1.2\text{mm}$

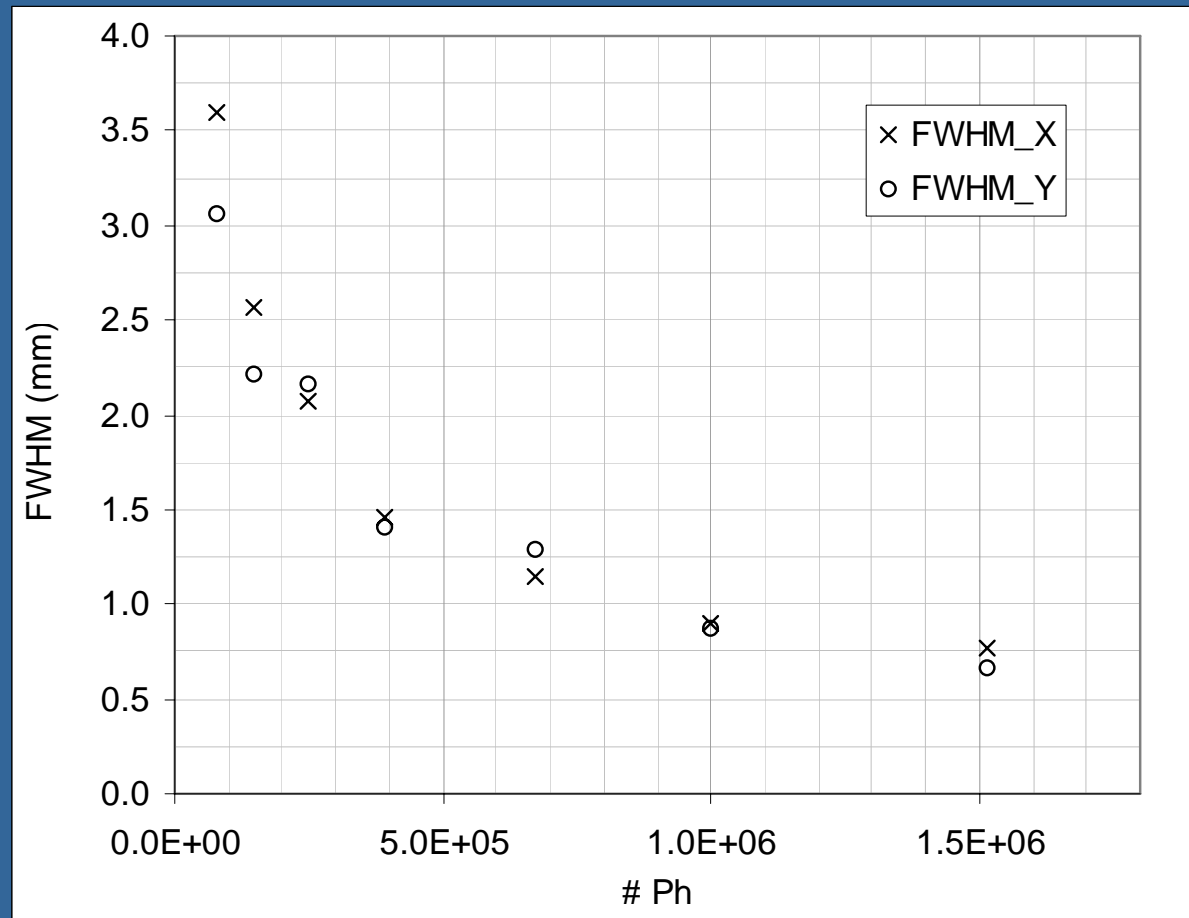
Simulations, F. Fraga, Hamburg meeting



4 PMTs, 34 mm \emptyset effective area, mask 9x1mm \emptyset holes

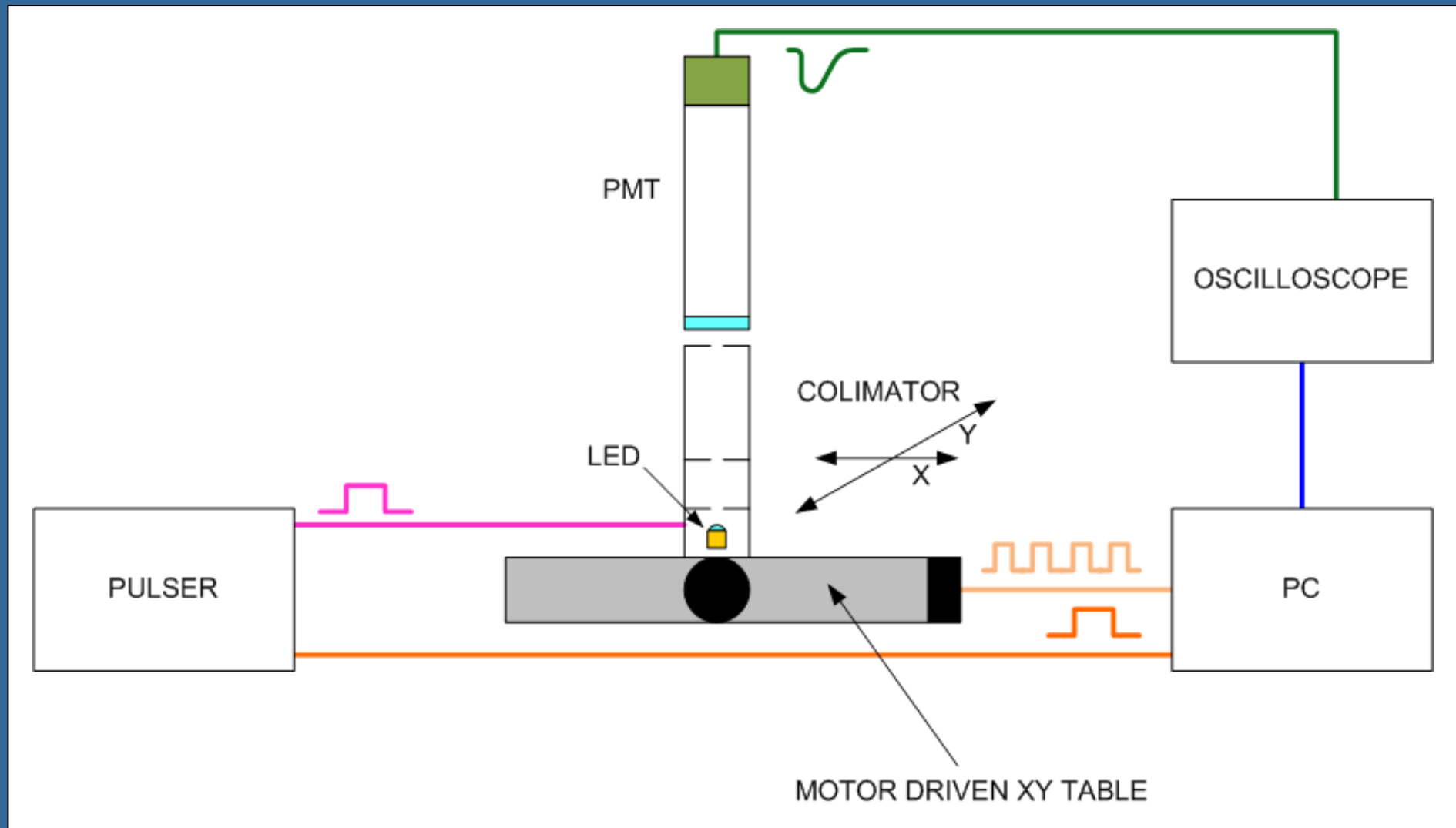
Experimental results obtained with GEMs with Ar 5%CF₄

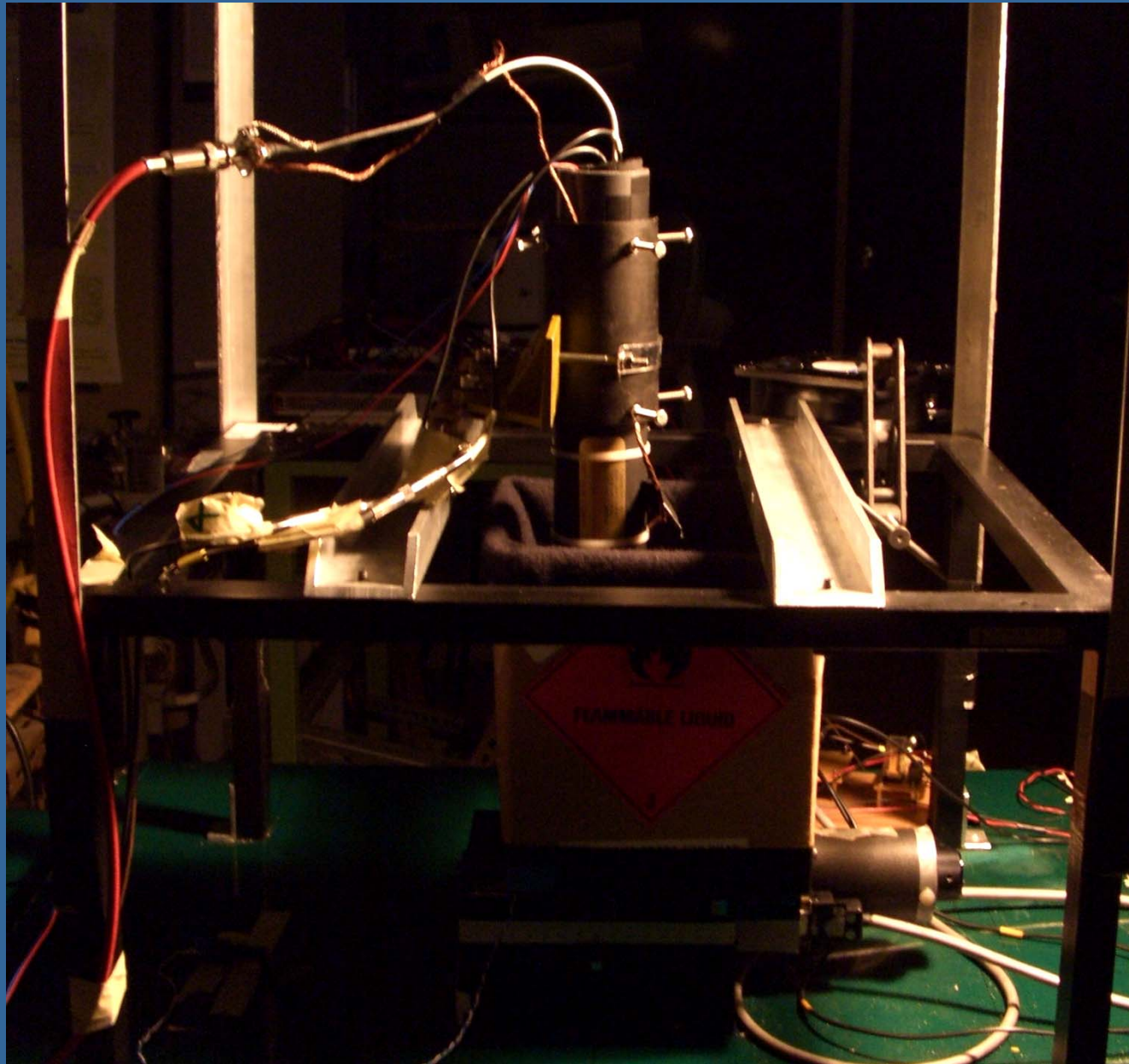
FWHM versus number of avalanche photons



Experimental results considering an uniform photocathode

Experimental set up



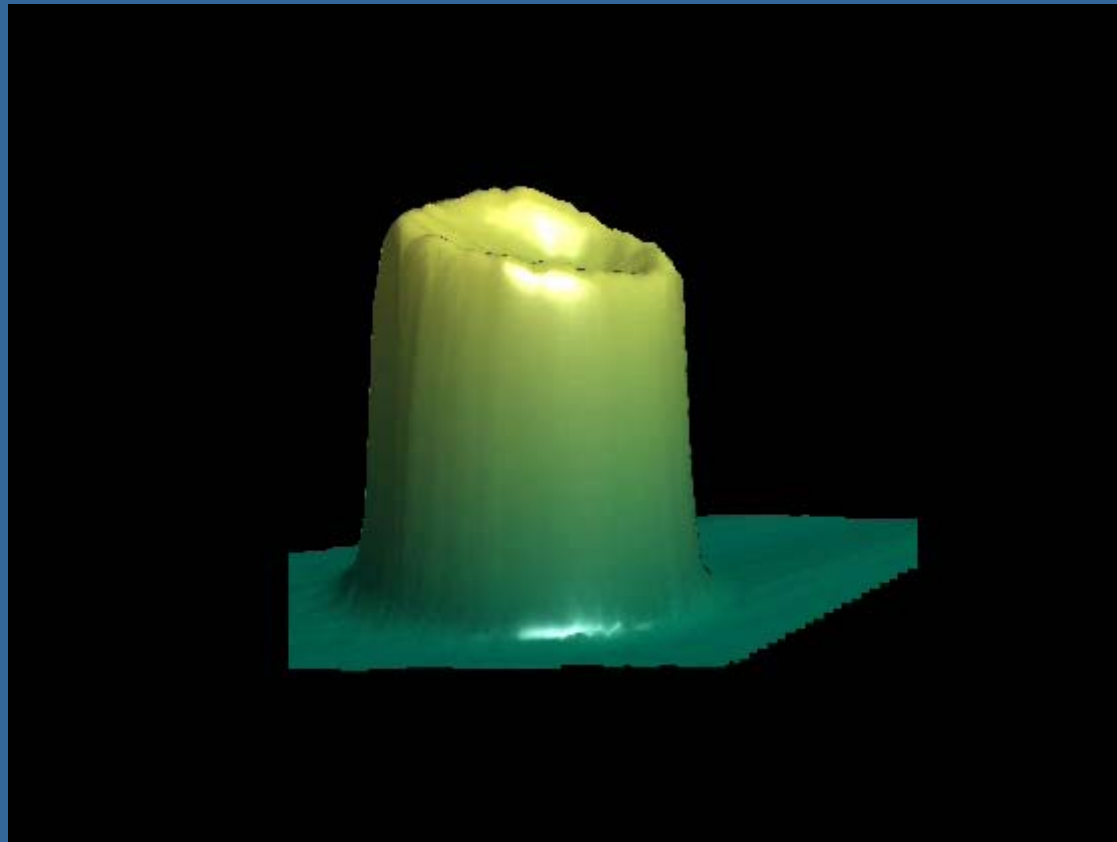


Hamamatsu R1387

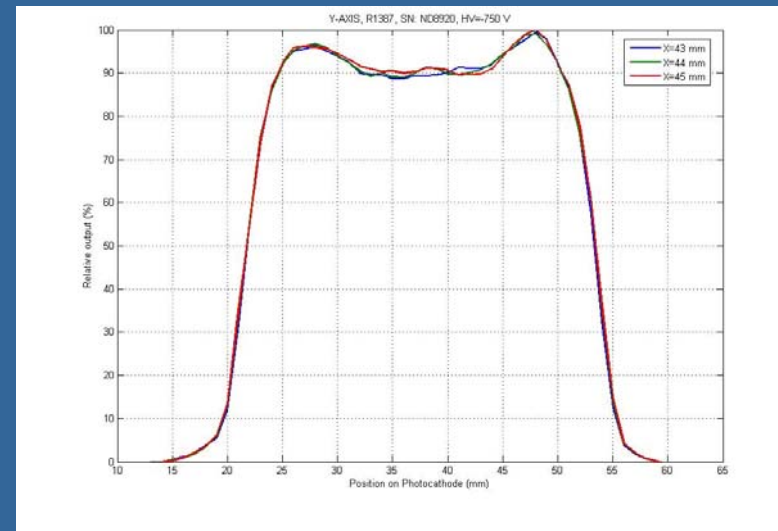
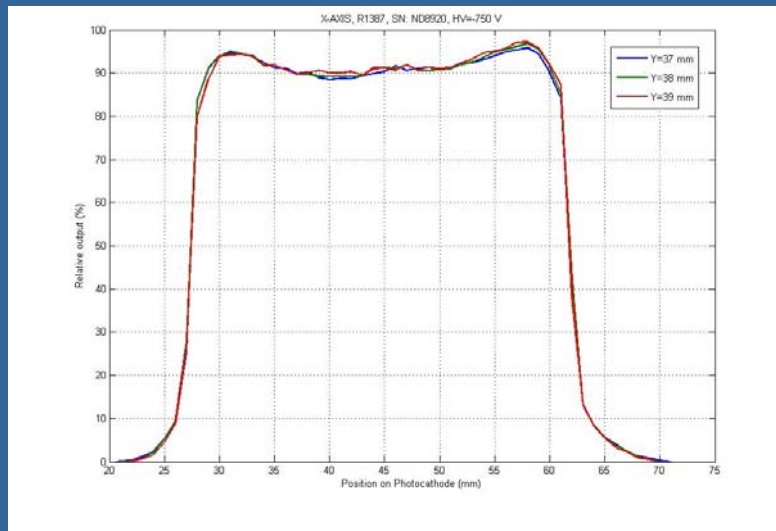
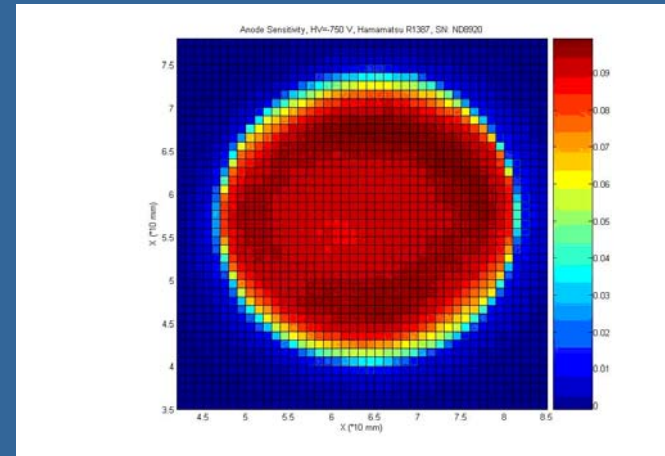
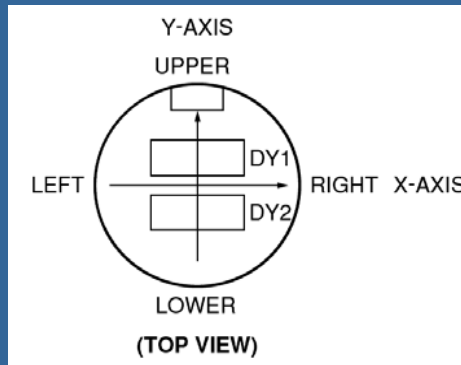
\emptyset effective = 34 mm

Standard passive base

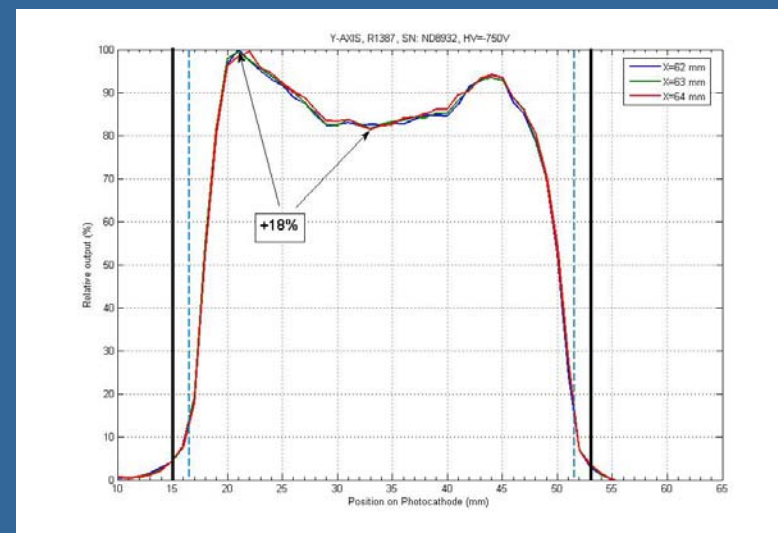
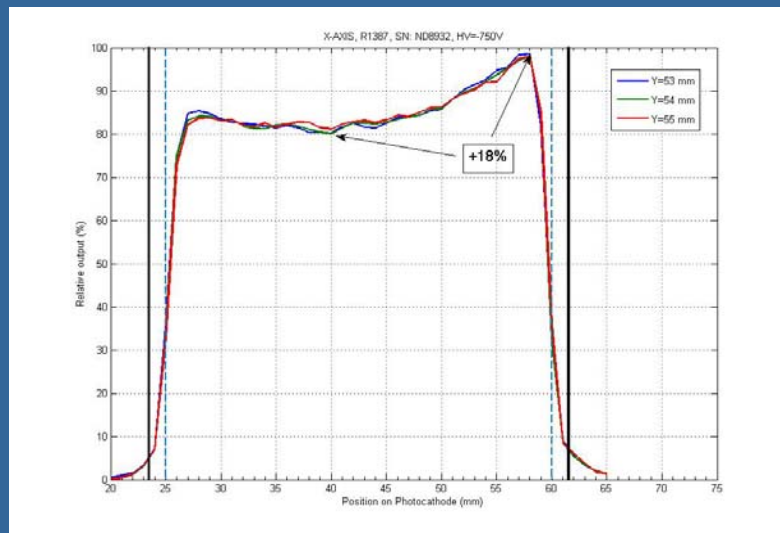
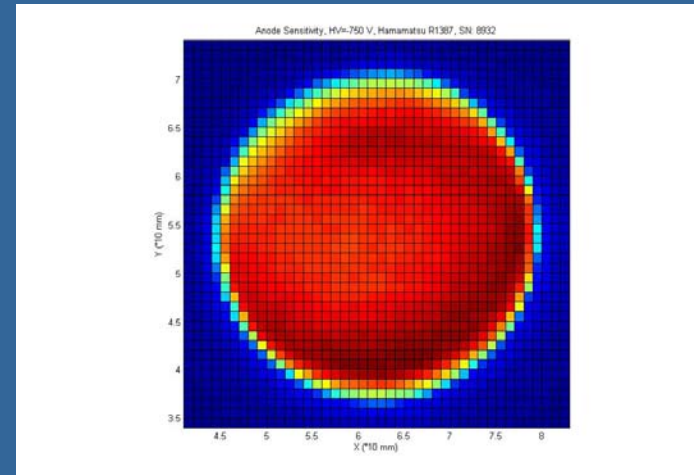
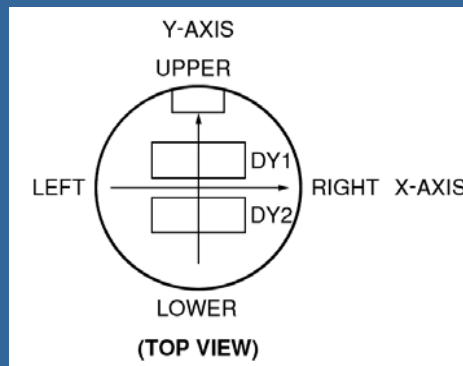


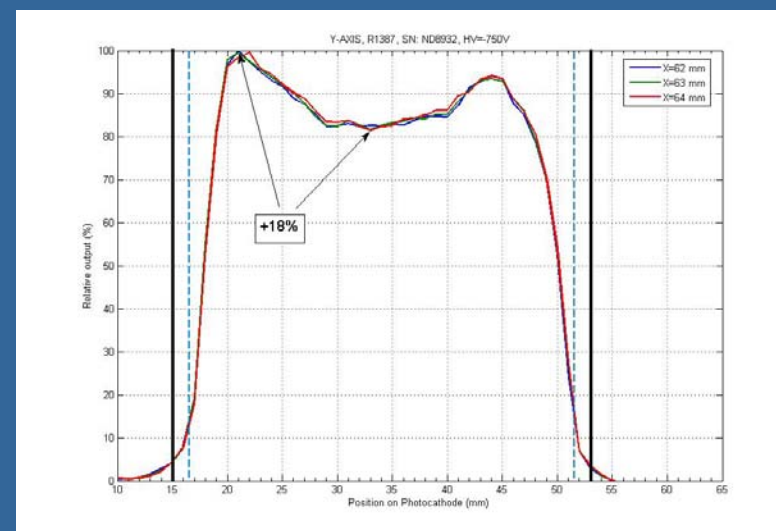
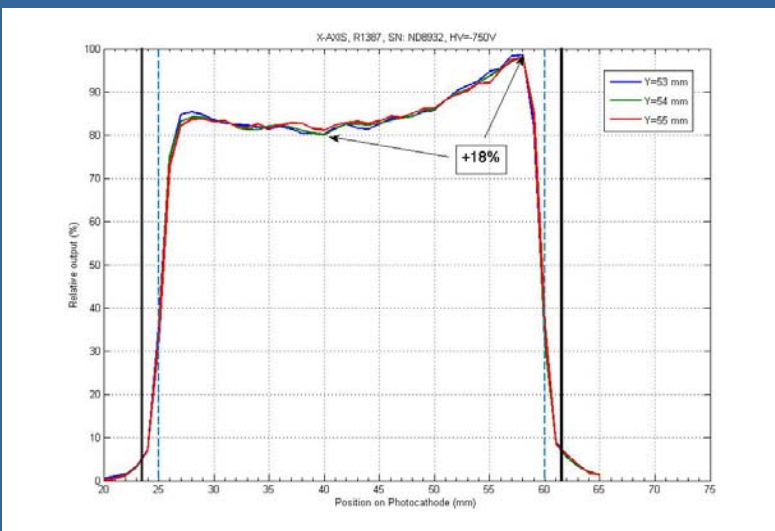
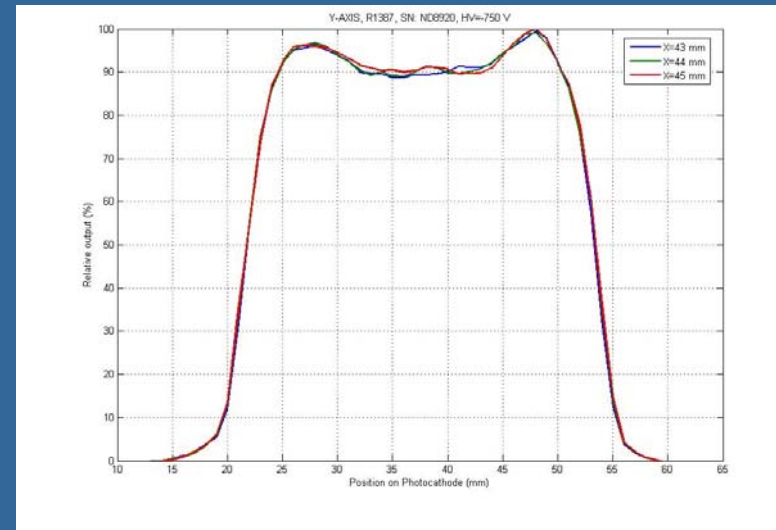
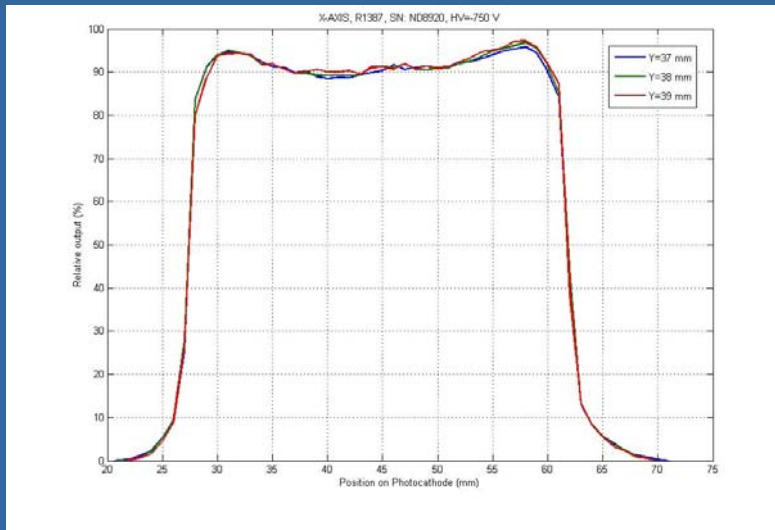


PMT: Hamamatsu R1387
SN: ND8920
HV = -750 V
LED: NICHIA NSHU590, $\lambda = 370$ nm



PMT: Hamamatsu R1387
SN: ND8932
HV = -750 V
LED: NICHIA NSHU590, $\lambda = 370$ nm

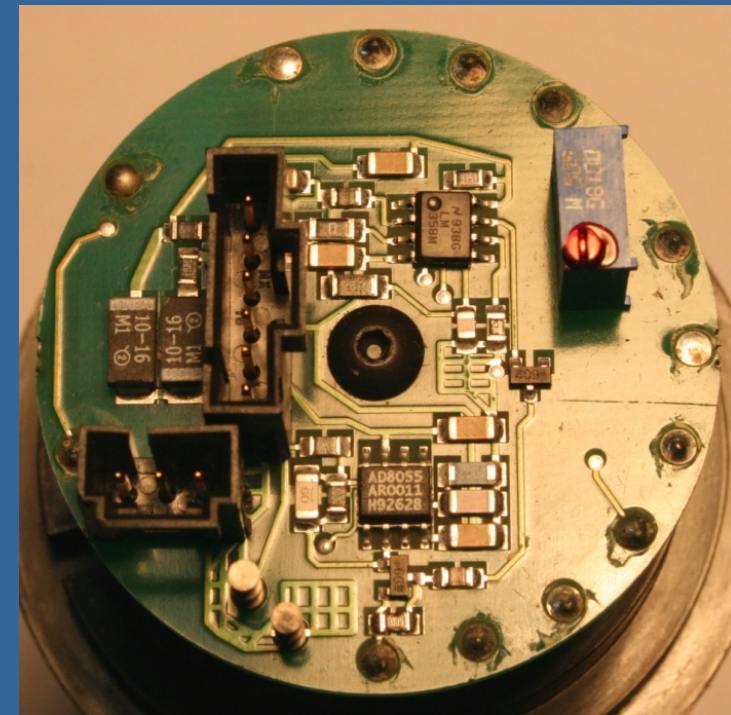




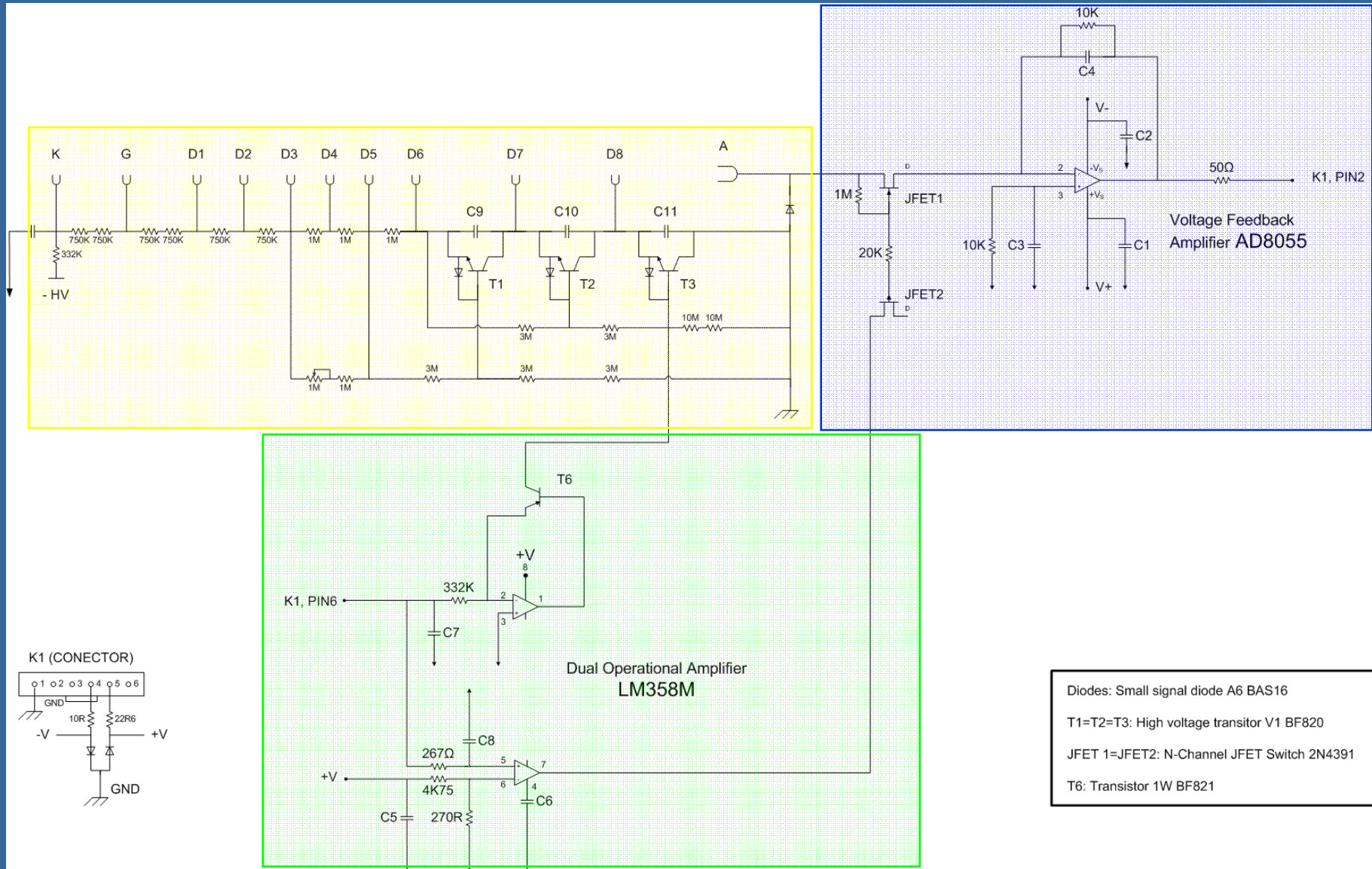
Photonis XP5602

Ø effective = 56 mm

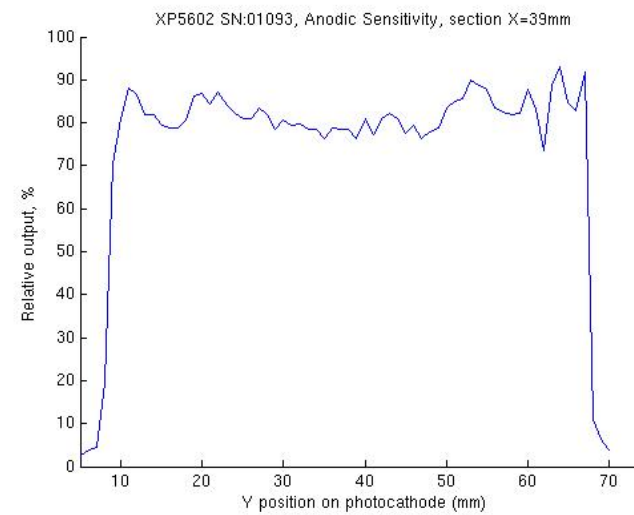
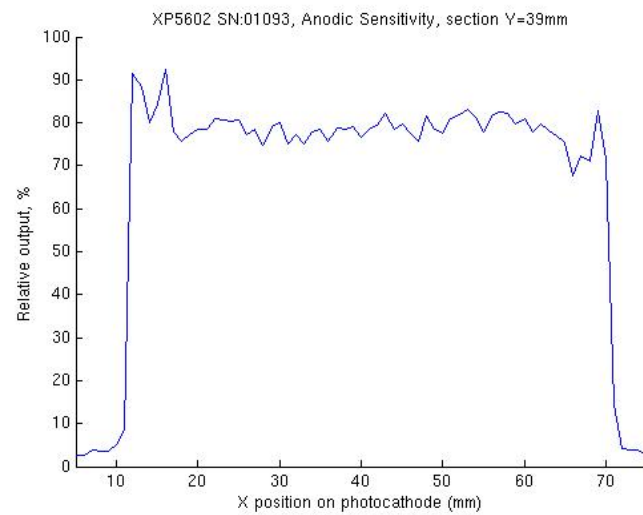
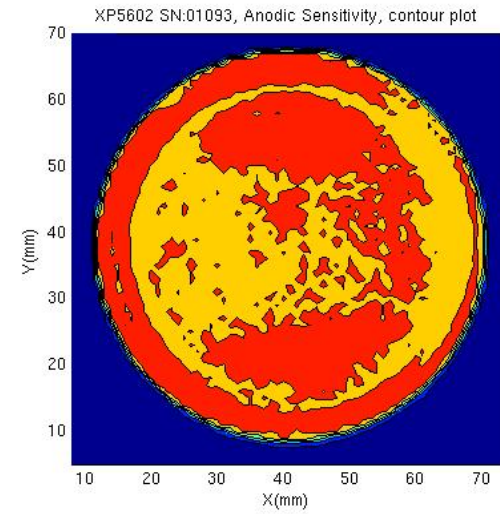
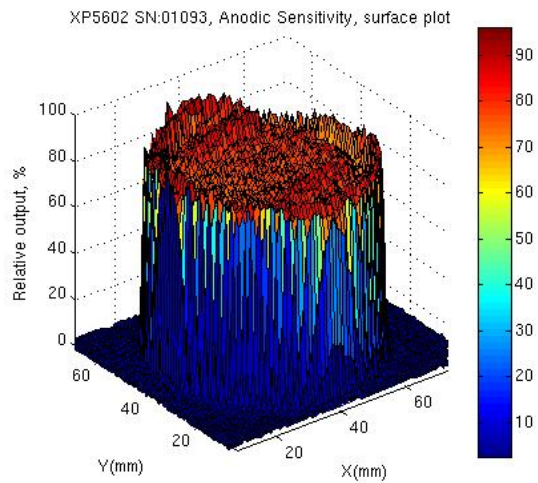
Active base

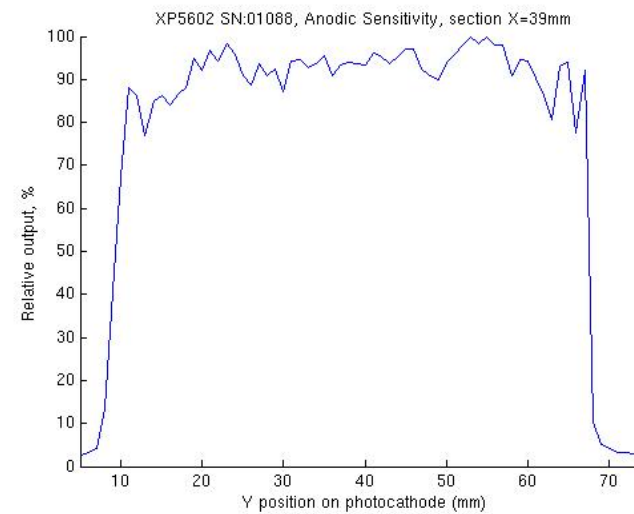
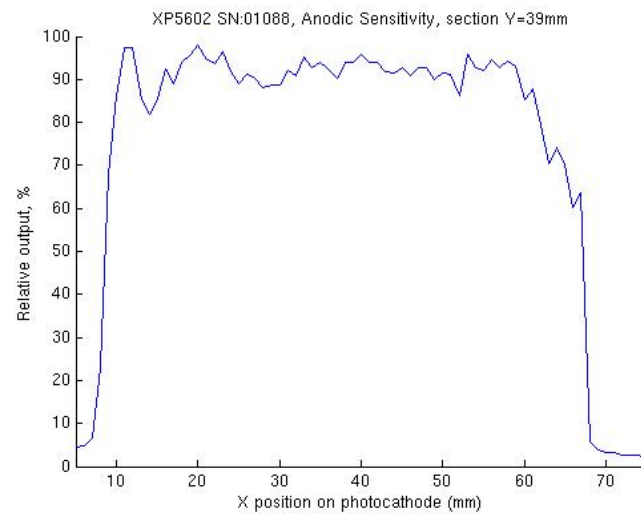
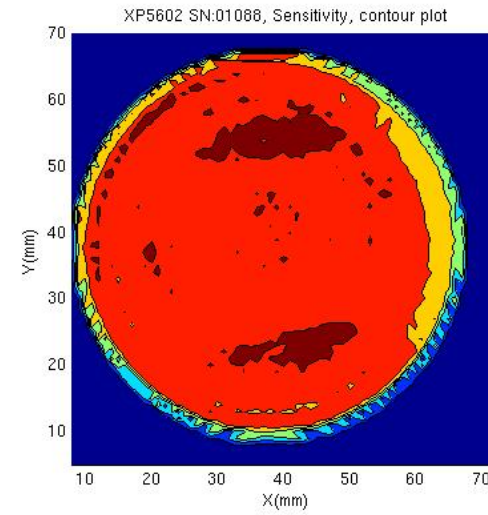
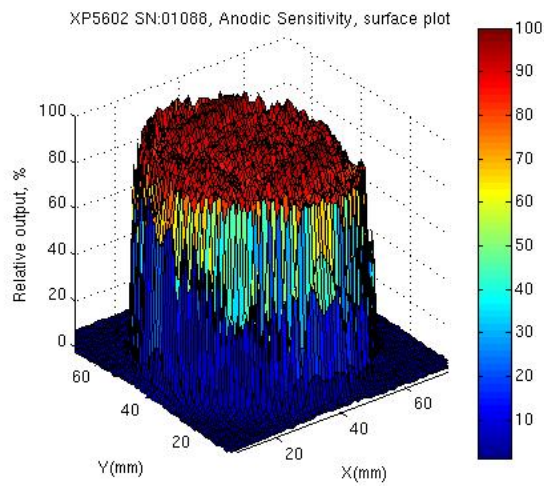


PMT electronics

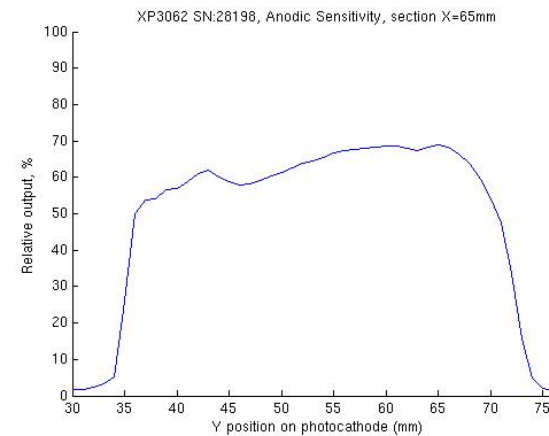
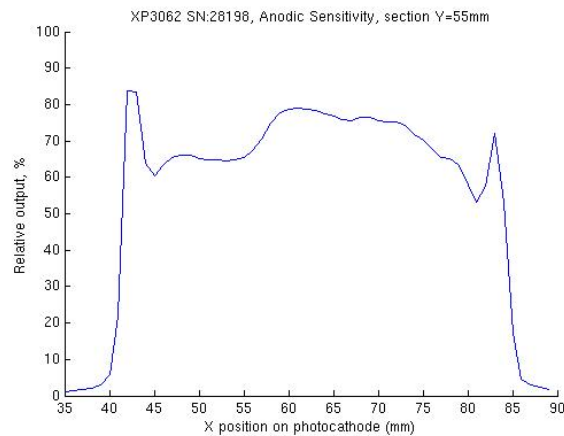
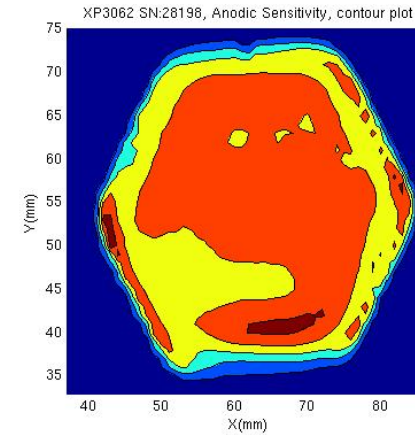
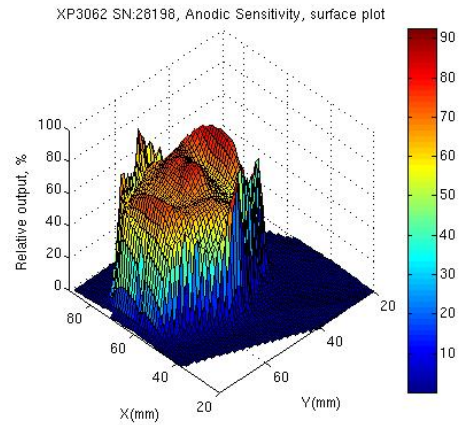


Diodes: Small signal diode A6 BAS16
 T1=T2=T3: High voltage transistor V1 BF820
 JFET 1=JFET2: N-Channel JFET Switch 2N4391
 T6: Transistor 1W BF821





Photonis XP3062 from Auger



FUTURE WORK

- Test other type of PMTs
- Different wavelengths
- Angular dependence



End