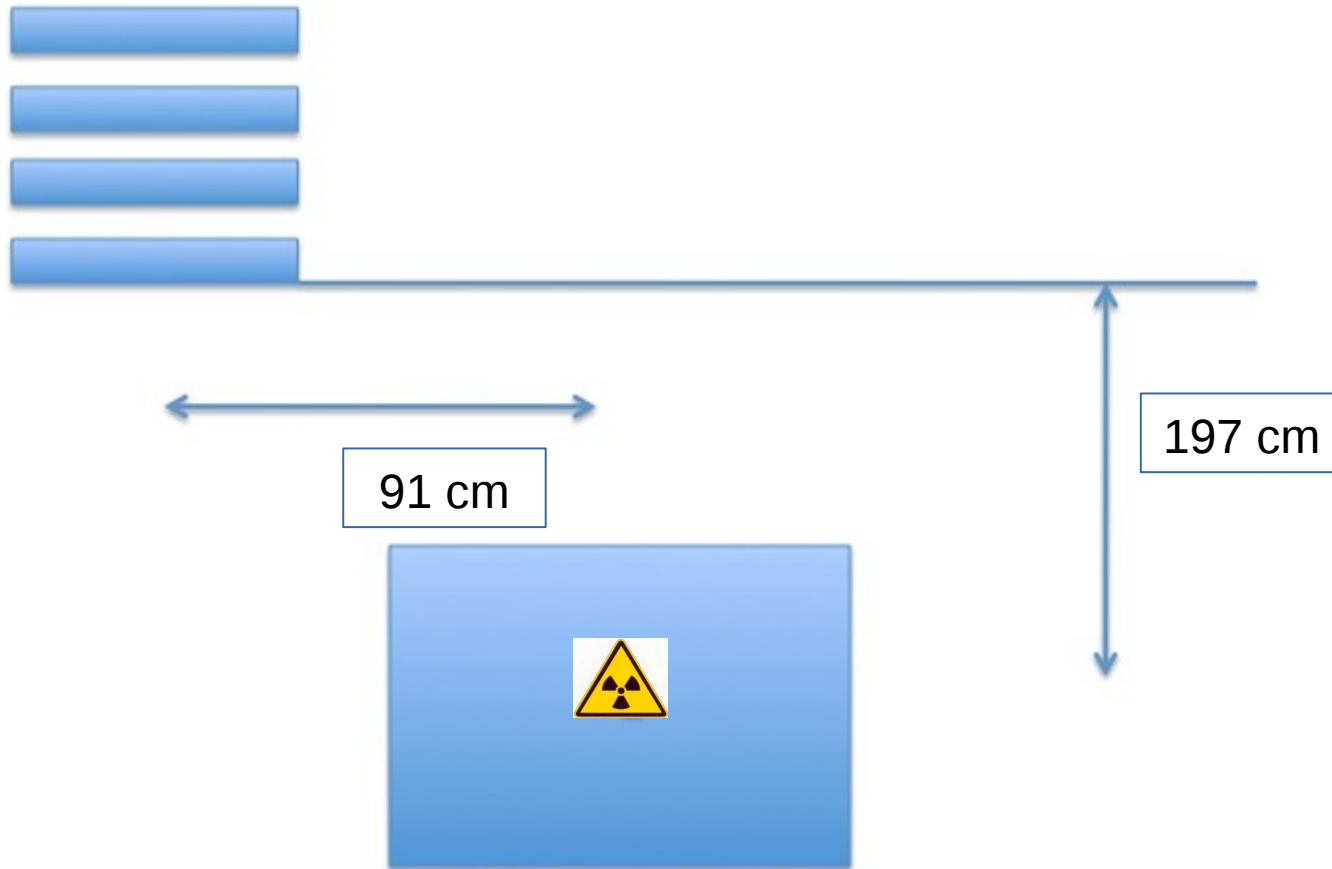# GRPC
Third report from August 2015 GIF++ test beams

Disclaimer: all results are preliminary

Francois Lagarde, Maxime Gouzevitch, Imad Laktineh

on behalf of GRPC team from IPNL

1) GRPC position : since Fri. 28/08/2015 at 3 pm

197 cm

91 cm

2) Rate estimation

1) Radiation map method :
  - Map * γ conversion factor
  - Need to know the map γ, and the shadow effects.

2) Chambers rate method :
  - Chambers rate when beam is off
  - Substract noise (no beam no source run)
  - Correct by efficiency (saturation effeciency)

3) Current method :
  - Total current in the chamber divided by the surface
and Charge/γ factor.

  – We need YOUR input for comparison !!!
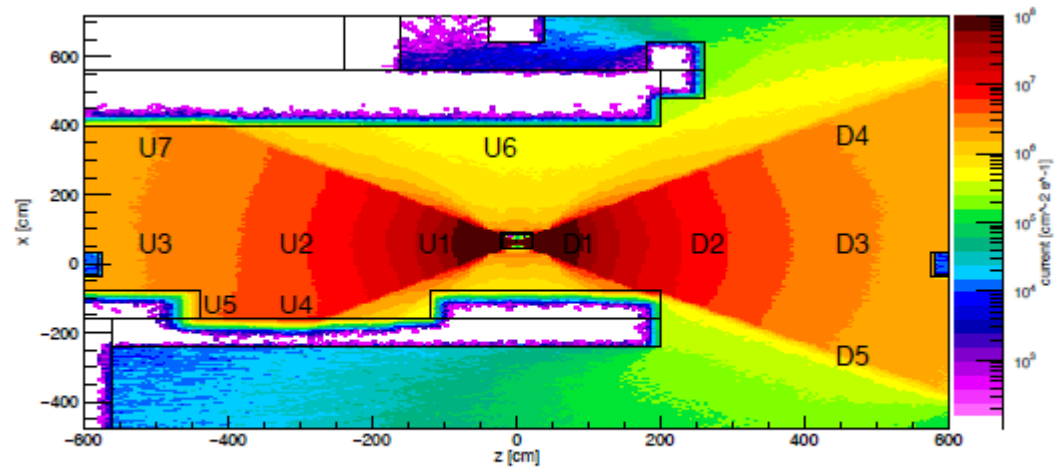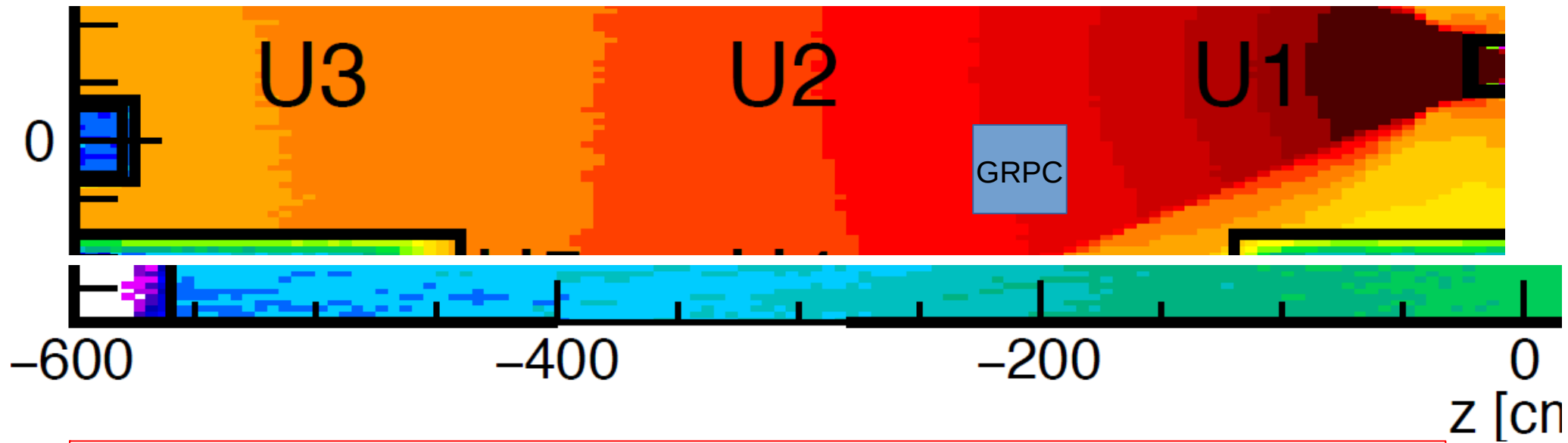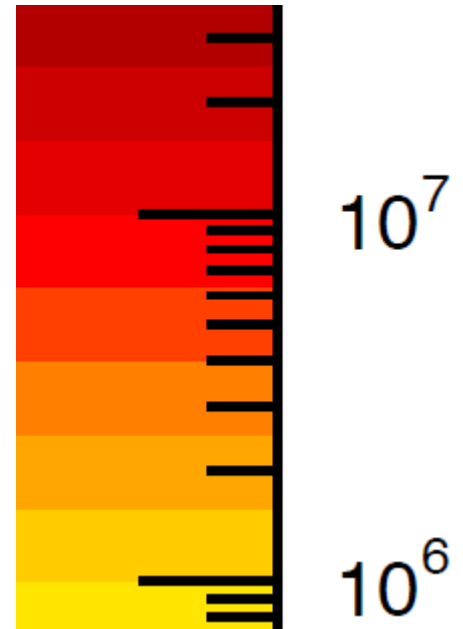
2.1) Rate estimate with simulation

Figure 17. Total Current x: Downstream open, upstream open

We think that the rate in our region is around : 7e6 – 1.5 e7

GRPC team - 07/08/2015

2.2) Rate estimate with simulations

| U1 | 8.7E+03 | 1.5E+04 | 3.0E+04 | 1.8E+05 | 3.0E+05 | 3.9E+06 | 3.5E+06 | 4.6E+06 | 6.9E+06 | 7.6E+06 | 3.2E+07 | 5.9E+07 |
| U2 | 0.0E+00 | 7.9E+02 | 1.3E+04 | 7.0E+04 | 9.6E+04 | 6.9E+05 | 3.9E+05 | 3.2E+05 | 6.8E+05 | 7.8E+05 | 3.3E+06 | 6.3E+06 |

We think that the rate in our region is around : 7e6 – 1.5e7
We are in between U1 and U2.

Assuming a conversion factor f = 1e-3 :

R(predicted) ~ 0.7 – 1.5e4 = 7-15 kHz

2.2) Rate estimate with chambers : source ATT = 100

Runs	729817	729595		729818			
Position Z	Source On	Noise	Difference	Eficiency			Position Z relative
							0
2025	143,306	2,034	141,272	0,478846	295,025958		55
2135	178,728	0,739116	177,988884	0,953789	186,612431		165
2190	136,743	0,17508	136,56792	0,875	156,077623		220
2300	206,601	18,2	188,401	0,77757	242,294584		330

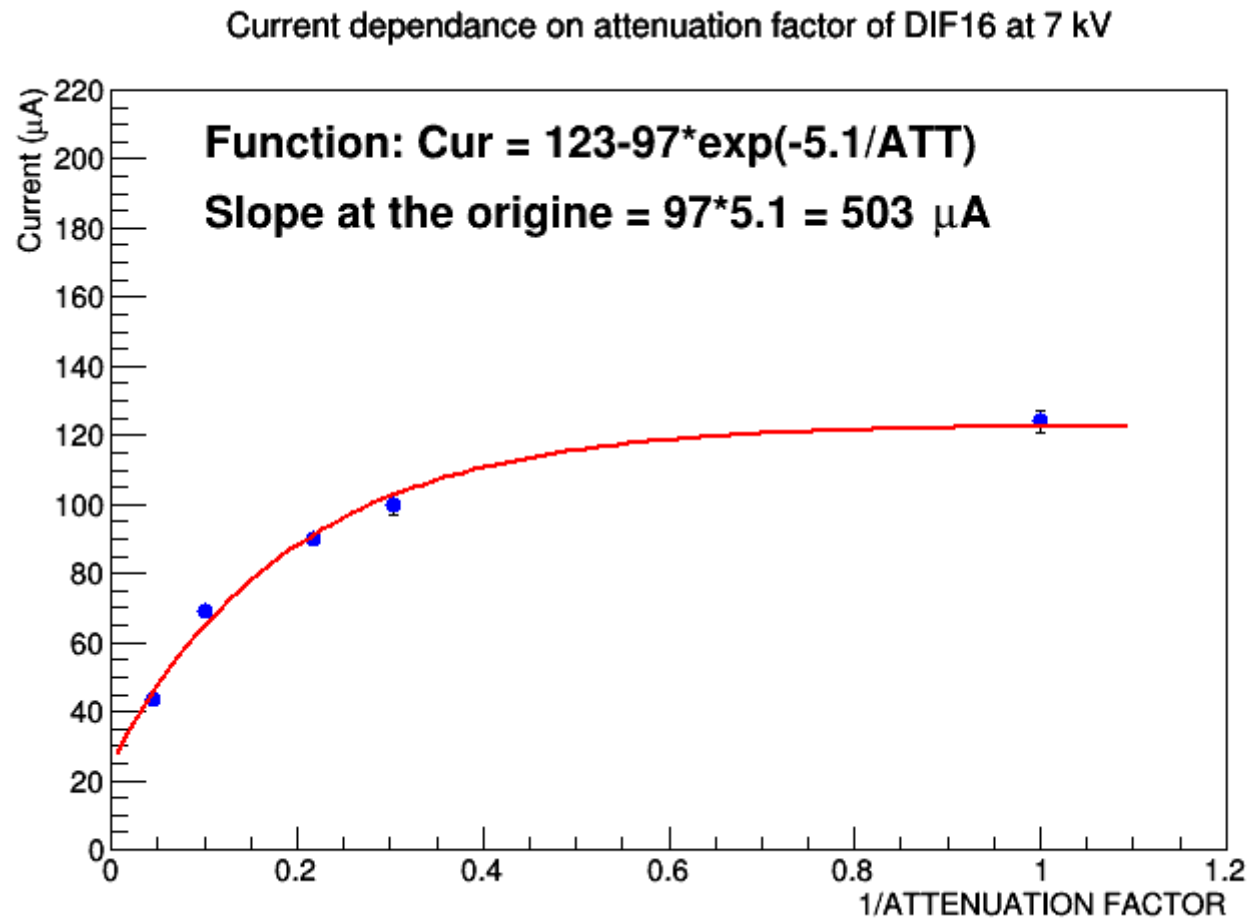| Distance	1970	mm
Attenuator	100	
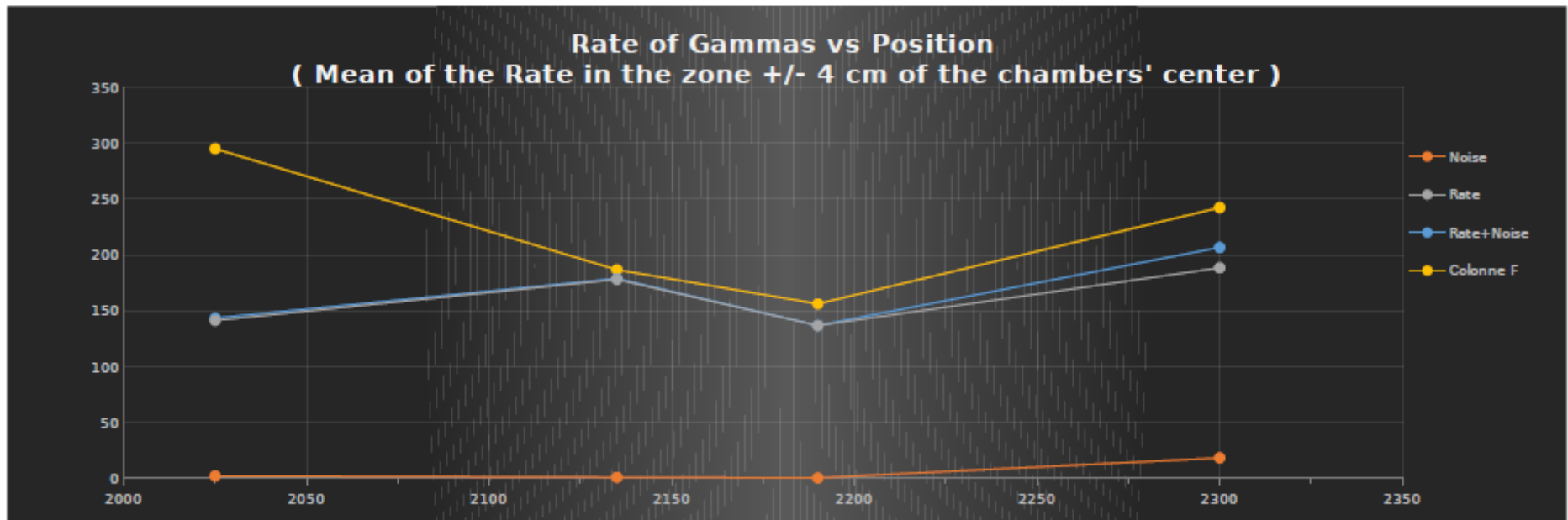
Z-axis position of the chambers wrt to the source in mm

Rate is estimated with chambers :
Rate(chambers) = (Total Rate – Noise)/eff
Comparison : estimation from Maps – 70-150 Hz

1) At ATT = 100 we are not in saturation regime.

Current dependance on attenuation factor of DIF16 at 7 kV

Function: Cur = 123-97*exp(-5.1/ATT)

Slope at the origine = 97*5.1 = 503 μA

2.4) Status summary

1) Radiation map method :
    - Map * γ conversion factor ~ 7-15 kHz
    - γ conversion factor need to be more investigated
    - shadow of the Micromegas and our own chambers
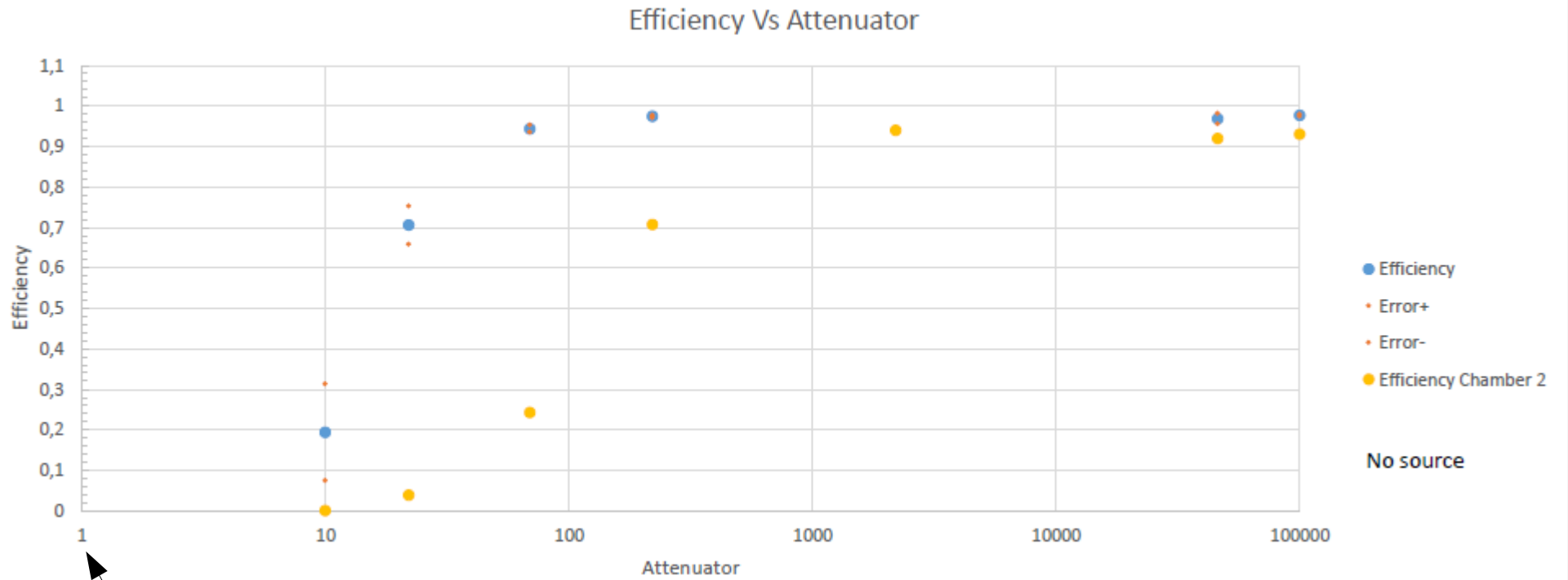needs also to be understood

2) Chambers rate method :
    - Chambers ~ 20 - 30 kHz
    - the ASICS thereshold impact on the rate counting
shall be understood.

3) Current method :
    - Charge/γ shall be measured.

        – We need YOUR input for comparison !!!

3) Efficiency curve (DIF16)

γ rate before
conversion :
~10 kHz/cm2