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20/1/2020

open in F.C.,  $E_p = 4.1 \text{ eV} (!!!)$

$$I_{Fe} = 2.16 \text{ mA}$$

at 1900  $E_p = 4.6 \text{ eV}$

$$\text{set } E_0 = 265$$

conducto DPH de 3 + 1 (?)

$$DPV = 1 \text{ (ave 0.86)}$$

$$I_{Fe} = 785 \text{ pA}$$

$$\text{set } E_0 = 960$$

extremamente estable en f.E. (de 2.490

3.7 mJ poti cumuli

$$\text{set } E_{Fe} = 1.9 \text{ A} \rightarrow I_{Fe} 1.8$$

$$I_{Fe} \approx 8 \text{ pA}$$

$$T_{APD} = 3.5 \cdot 10^{-8}$$

21/1/20

9:30       $P_{\text{ref}} = 8.3 \cdot 10^{-10}$        $P_{\text{new}} = 9.7 \cdot 10^{-10}$

$P_{APD} = 1.5 \cdot 10^{-8}$       8.39 stay looking

10:40       $P_{\text{ref}} = 8.2 \cdot 10^{-10}$        $P_{\text{new}} = 9.6 \cdot 10^{-10}$        $P_{APD} = 5.2 \cdot 10^{-9}$

12:41       $P_{\text{ref}} = 8.3 \cdot 10^{-10}$        $P_{\text{new}} = 9.9 \cdot 10^{-10}$        $P_{APD} = 5.3 \cdot 10^{-9}$

$T = 27$

$$E_0 = 900 \quad \text{new} \quad E_p = 4.9 \text{ eV} \quad (I_{PL} = 1.8)$$

$$I_{Fe} = -1.15 \text{ pA} \quad (\text{keysight})$$

frost:  $3.6 \cdot 10^{-9}$  auben       $P_{\text{min}} = 9.6 \cdot 10^{-10}$  auben  
 (volume dose)

Volume auben

$$P_{\text{ref}} = 5.5 \cdot 10^{-9} \quad P_{\text{min}} = 1.5 \cdot 10^{-9} \text{ auben}$$

$$I_{Fe} = -1.14 \text{ pA} \quad (DFV = 1.5 \quad DFT = ?)$$

deflection per FC

deflection soll:  $\Delta PD$

$$DFV = 12.5 \quad DFT = -24.5$$

Scan DFT su APD misurato Keysight  
APD non polarizzato  
[-60, 15, 0.5, 1] 21 gen 20-01-2021

(distribuzione C/obiettivo/APD-test)

APD non polarizzato collegato al termosensore  
"No sellino" altri termocouple aperti

→ Scan su DFT set DFT = 170

Scan DFT su APD misurato Keysight

con APD polarizzato  $V_p = 383$  V

(scatola disaccoppiamento e messa a terra)  
CAEN

[-60, 15, 0.5, 1]

-01

Scan DFT mentre APP per 17.5 (verso 17.5 sul bordo)

set centro  $DFT \approx -27.5$  (verso 27.5 sul bordo)

$DFT = 17.5$

$DFT = -30$

posti con su APD

$E_0 = 900$  eV

Richiamo a questo momento polarizzatore APD  
con CAEN NDT1670

Rifomiamo il SILENTA 7712

Scan DFT su APD (Keysight)

[-45, 15, 0.5, 1]

-02

22/11/2020

Qua su FC  $E_p = 6,85 \text{ eV} (!!!)$

$$I_{FC} = 1.25 \text{ pA}$$

$$(E_p = 6.85)$$

PS per APD 2bus

Polarizzazione

CAEN NDT 1170

$$V_{APD} = 350$$

$$I_{APD} = 91 \text{ mA}$$

con forza elettronica su APD  $I_{APD} = 92 \text{ mA}$

Scan DFT  $[-45, -10, 0.5, 1]$   $\rightarrow$  22/11/20-01

$$V_{APD} = 360$$

scan DFT  $[-45, -10, 0.5, 1]$   $\rightarrow$  -02

$$V_{APD} = 370$$

scan DFT  $[-45, -10, 0.5, 1]$   $\rightarrow$  -03

$$V_{APD} = 380$$

scan DFT  $[-45, -10, 0.5, 1]$   $\rightarrow$  -04

$$I_{FC} = 1.02 \text{ pA}$$

DEPRESSION ~~EXPO~~ FC

$$DFV = 8$$

$$DFH = 5$$

Deflessione

~~APD~~

$$DFV = 17.5$$

$$DFH = -30$$

(misurato con  
~~multimeter~~ Keithley)

$$E_p = 7 \text{ eV} \quad I_{FC} = 1.21 \text{ pA}$$

Rimosso APD, otturatore  $\oplus E_p$  con APD  
polarietà  $\pm 380 \quad E_p = 6.98$

$$V_{APD} = 380 \quad DFTI \text{ scan } [-45, -10, 0.5, 1, 1] \quad -05$$

$$V_{APD} = 370 \quad DFTI \text{ scan } [ ] \quad -06$$

$$V_{APD} = 360 \quad DFTI \text{ scan } [ ] \quad -07$$

$$V_{APD} = 350 \quad DFTI \text{ scan } [ ] \quad -08$$

$$I_{FC} = -1.21 \text{ pA} \quad (\text{modo -870})$$

~~$$\text{set Anodo -870} \quad I_{FC} = -378 \text{ fA} \quad E_p = 7.00$$~~

Rimosso APD, polarietà  $\pm 380$   
otturatore  $E_p = 7.0$

$$V_{APD} = 380 \quad DFTI \text{ scan } [-45, -10, 0.5, 1, 1] \quad -09$$

$$= 370 \quad DFTI \text{ scan } [ ] \quad -10$$

$$= 360 \quad DFTI \text{ scan } [ ] \quad -11$$

$$= 350 \quad DFTI \text{ scan } [ ] \quad -12$$

$$I_{FC} = -375 \text{ fA}$$

$\Delta X = \Delta V \frac{e}{q}$

Dopo 2 sec  $E_p = 7.2$   $I_{FC} = -420 \text{ pA}$

set Anodo = -820 V  $I_{FC} = -106 \text{ fA}$

Inserito APD |  $V_{APD} = 380$   $E_p = 7.35$

$V_{APD} = 380$  DFT scan  $[-45, -10, 0.5, 1, 1]$  — 13

$V_{APD} = 370$  DFT scan [ ] — 14

$V_{APD} = 360$  DFT scan [ ] — 15

$V_{APD} = 350$  DFT scan [ ] — 16

Anodo su FC  $I_{FC} = -111 \text{ fA}$

$$\Delta m56 = -820$$
$$f_{m56} = -820$$

set Anodo -820  $I_{FC} = -84 \text{ fA}$

set focus -820  $I_{FC} = -36 \text{ fA}$   
(was -897)

$E_p = 7.35$   $I_{FC} = -39 \text{ fA}$

Inserito APD  $V_{APD} = 380$   $E_p = 7.35$

$V_{APD} = 380$  DFT Scan [ ] — 17

$V_{APD} = 370$  u u [ ] — 18

$V_{APD} = 360$  a n [ ] — 19

$V_{APD} = 350$  u n [ ] — 20

$E_{FC} = -40 \text{ fA}$

Set focus -680  $I_{pc} = -13.2 \text{ fA}$

$I_p = 7.45$   $I_{fc} = -14.3 \text{ fA}$

laser 1500 APD  $V_{APD} = 380$   $E_p = 7.35$

$V_{APD} = 380$  DFT scan [ $-15, -10, 0, 5, 1$ ] -21

$V_{APD} = 360$   $\approx$  [-22

$V_{APD} = 370$   $\approx$  [-23

No 350 too low barrier at sequence

Fe  $I_{pc} = -6.1 \text{ fA}$  (Rate  $E_p = 7.35$ )

Scan  $E_p \rightarrow \max \approx 7.5$   $I_{pc} = 14 \text{ fA}$

Set Anode -810 set Focus -896

$ZE_p = 7.40$   $Z_{fc} = -1.05 \text{ pA}$

23/11/2020

$E_p = 7.9 \text{ eV}$   $I_{pc} = -2.0 \text{ pA}$

Set  $I_{fc} = 1.89$

$$\text{PLV} = -0.022 \quad \text{RLH} = -0.055$$

$$\text{Focus} = -895.5 \quad \text{Anode} = -881$$

$$E_p = 7.5 \quad | \quad I_{TC} = -165 \text{ pA}$$

$$\text{Inset to APD} \quad V_{APD} = 380 \quad E_p = 7.93 \quad (1)$$

$$V_{APD} = 380 \quad \text{DFH Scan } [-45, -10, 0.5, 1, 1] \quad 28 \text{ pm}^2 - 0.1$$

$$q \quad \text{DFV Scan } [0, 35, 0.5, 1, 1] \quad (\text{DFH} = 30) \quad -0.2$$

$$\text{Anode} = -45, -15$$

$$\text{Anodes} \quad 0, 30 \quad 1 \quad E_p = 8$$

$$V_{APD} = 370 \quad \text{DFH Scan } [-45, -10, 0.5, 1, 1] \quad -0.3$$

$$V_{APD} = 360 \quad \text{DFH Scan } [ ] \quad -0.4$$

$$E_p = 8.10$$

$$V_{APD} = 350 \quad \text{DFH Scan } [ ] \quad -0.5$$

$$V_{APD} = 40 \quad \text{DFH Scan } [ ] \quad -0.6$$

$$V_{APD} = 20 \quad \text{DFH Scan } [ ] \quad -0.7$$

$$V_{APD} = 10 \quad \text{DFH Scan } [ ] \quad -0.8$$

$$\pi \quad n \quad u \quad u \quad u \quad -0.9$$

$$-1.0$$

$$E_p = 8.25$$

$$V_{APD} = 10 \quad \text{DPH Scan } [ ] \sim 11$$

$$\begin{matrix} u & u & u \\ u & u & u \end{matrix} \sim 12$$

$$\begin{matrix} u & u & [-45, -10, 0.5, 3, 1] \\ u & u & \end{matrix} \sim 13$$

$$E_p = 8.35 \text{ (in APD), netto Fe}$$

$$I_{Fe} = -207 \text{ pA} \quad \text{era } 165 \text{ pA}$$

$$E_p = 8.30 \quad I_{Fe} = 207 \text{ pA} \quad 15.52$$

$$\text{set Anodo } -850 \quad E_p = 8.3 \text{ CV}$$

$$\Rightarrow \boxed{I_{Fe} = -30.3 \text{ pA}}$$

$$\text{inerto APD} \rightarrow V_{APD} = 380 \quad E_p = 8.45$$

$$V_{APD} = 380 \quad \text{DPH Scan } [-45, -10, 0.5, 1, 1] \sim 14$$

$$V_{APD} = 370 \quad \text{DPH Scan } [ ] \sim 15$$

$$E_p = 8.45$$

$$V_{APD} = 360 \quad \text{DPH Scan } [ ] \sim 16$$

$$V_{APD} = 350 \quad \text{DPH Scan } [ ] \sim 17$$

Tomogramma sulle FC,  $I_{FC} = -29,5 \text{ pA}$

max  $E_p = 8.45$  (come prima)

set Focus = -850 }  $(wes = -895,5)$

(anodo = -850) }  $\rightarrow \boxed{I_{FC} = -9.9 \text{ pA}}$

Inserito APD  $V_{APD} = 380$   $E_p = 8.45$

$V_{APD} = 380$  DFT scan [ ] — 18

$V_{APD} = 370$  DFT scan [ ] — 19

$V_{APD} = 360$  DFT scan [ ] — 20

$V_{APD} = 350$  DFT scan [ ] — 21

$E_p = 8.5$  (su APD) (variazioni < 1%)

Inserito FC,  $I_{FC} = -10.2 \text{ pA}$  ( $E_p = 8.5$ )

$E_p = 8.45$   $\&$   $I_{FC} = -9.9 \text{ pA}$

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set focus -894,5, anodo = -850,  $E_p = 8.5$

$I_{FC} = -34.6 \text{ pA}$

Inserito APD  $V_{APD} = 380$   $E_p = 8.55$

## Curve I-V

$$V_{APD} = 10$$

DFH Scan  $[-48, -10, 0.5, 1, 1]$  - 22

n

"  $[-48, -10, 0.5, 1, 1]$  - 23

m

" " " " " - 24

APD spento

" " " " " - 25

b a

" " " " " - 26

## Curva I-V

$$V_{APD} = 10 \text{ V}$$

DFH Scan  $[-48, -10, 0.5, 1, 1]$  - 27

20 V

" " " " " - 28

40 V

" " " " " - 29

60 V

" " " " " - 30

80 V

" " " " " - 31

Gli siamo resi conto che le correnti visto erano troppo basse - Abbiamo infatti verificato (con una nuova ottimizzazione della puls energy) che il punto ottimale della puls energy e' comunque ora, il minimo e' a 9.15 V (era 8.55 V)

CURVA I-V

$V_{APP} = 10 \text{ V}$	DF H SCAN [-48, -10, 0.5, 1, 1]	- 32
20 V	"	- 33
40 V	"	- 34
60 V	"	- 35
80 V	"	- 36
100 V	"	- 37
150 V	"	- 38
200 V	"	- 39
250 V	"	- 40
300 V	"	- 41
310 V	"	- 42

La pun energy ottimale e' comunque di nuovo: 9,3 V

CURVA I-V ← questa volta riottimizziamo la pun energy  
dopo ogni punto

$V_{APP}$	FILE
10V	DF H SCAN [-48, -10, 0.5, 1, 1] - 43 $E_p = 9.3 \text{ V}$
20V	- 44 "
60V	- 45 "
100V	- 46 "
150V	- 47 "
200V	- 48 "
250V	- 49 "
300V	- 50 "
310V	- 51 $E_p = 9.35 \text{ V}$
320V	- 52 "
330V	- 53 "
340V	- 54 "
345V	- 55 "
350V	- 56 "
355V	- 57 "
360V	- 58 "
370V	- 59 "
380V	- 60 "
385V	- 61 "
375V	- 62 "
365V	- 63 "

Inserito FC  $I_{FC} = -27.5 \text{ pA}$

max  $E_p = 9.40 \text{ } \underline{\underline{I_{FC} = -29.5 \text{ pA}}}$