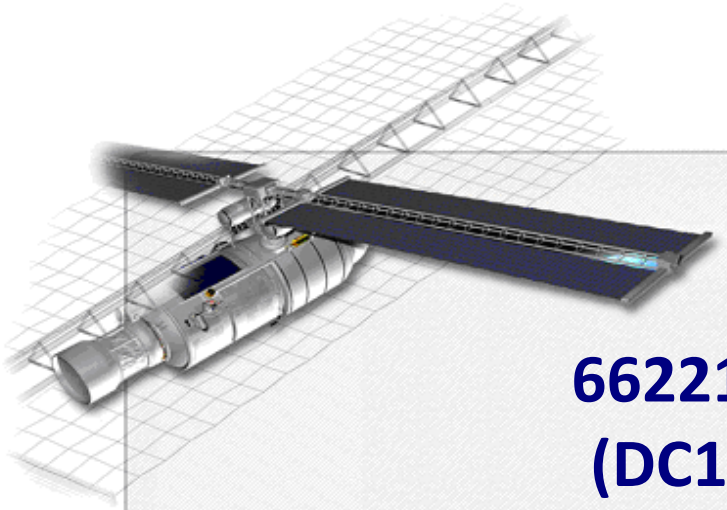
PROTONS DISPLACEMENT DAMAGE TEST REPORT



66221-103
(DC1122)
Single Channel Optocoupler
From
MICROPAC

TRAD/TP/66221/XXX1/ESA/YP/1104		Labège, April 16, 2012
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Issue : 0		
To: Marc POIZAT	Project/Program :	ESA Contract N°4000102571/10/NL/AF-Radiation Characterization of Laplace RH optocouplers, sensors and detectors

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1 INTRODUCTION

This report includes the test results of 66221-103, a Single Channel Optocoupler from MICROPAC to evaluate displacement damage effects under proton irradiation. During January and February 2012, TRAD characterized this device for proton sensitivity at KVI Facility, in GRONINGEN, The Netherlands using their AGOR cyclotron.
The objectives of the test are:

- to detect and measure the degradation of device parameters as a function of proton fluence,
- to determine if device parameters are within specified limits after exposure to final level of proton fluence.

2 DOCUMENTS

2.1 Applicable Documents

AD	1.	ESA contract	N°4000102571/10/NL/AF-Radiation Characterization of Laplace RH optocouplers, sensors and detectors
AD	2.	Irradiation Test Plan	ITP-TP-66221-MIC-ESA-1119, Iss.3, 08/02/2012

2.2 Reference Documents

RD	1.	Datasheet 66221 by MICROPAC	PROTON RADIATION TOLERANT OPTOCOUPLER dated 31/03/2011
RD	2.	MICROPAC certificate of traceability and conformance dated 25/07/2011	

3 DEVICE INFORMATION

3.1 Device description

The 66221-103 is a single channel device electrically similar to the 4N49. It contains an 850nm LED optically coupled to a silicon planar “40 x40” phototransistor. This product has been designed to be more tolerant to proton radiation. The 66221 optocoupler is packaged in a hermetically sealed 6 pin leadless chip carrier (LCC).

Type	66221-103
Manufacturer	MICROPAC
Function	Optocoupler
Package	LCC6
Date Code	1122
Sample size	46 parts (3x15 test parts + 1 control sample)

3.2 Procurement information

75 parts reference 66221-103 were delivered by MICROPAC through the French distributor ISOTOPE ELECTRONICS.
Their quality level defined by the 103 extension number corresponds to a commercial standard operating in the temperature range of -55° to +125°C and screened to TX level by the manufacturer prior to delivery. One single lot of 75 parts, date-code 1122, was delivered together with a Certificate of Conformance [RD2].

3.3 External view

Figure 1: package marking

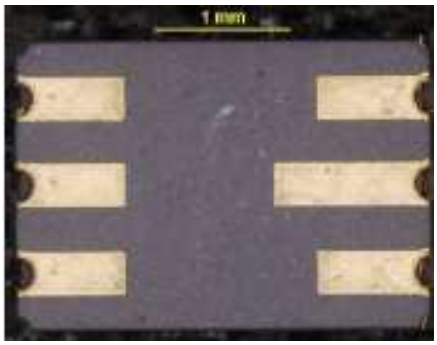


Figure 2: package back

3.4 Internal view

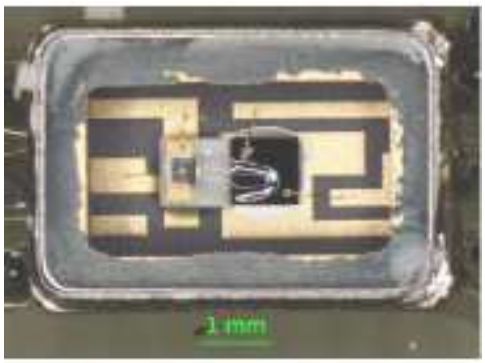


Figure 3: Internal general view

Figure 4: transistor and LED view

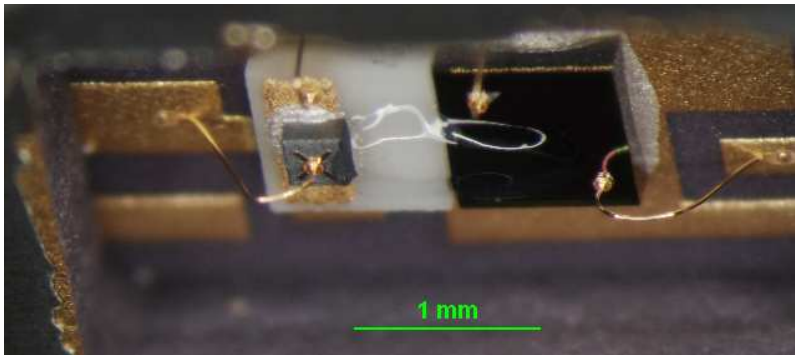


Figure 5: photodetector and LED view

3.5 Serialization

Each part is serialized to enable pre and post test identification and comparison. Control part is identified N°1. The same control part has been used for the three test sequences.

Serial Number			
P1 (30MeV)	P2 (60MeV)	P3 (190MeV)	Mode
1 (Control sample)			
2	2	2	Bias 1
3	3	3	Bias 1
4	4	4	Bias 1
5	5	5	Bias 1
6	6	6	Bias 1
7	7	7	Bias 2
8	8	8	Bias 2
9	9	9	Bias 2
10	10	10	Bias 2
11	11	11	Bias 2
12	12	12	Off
13	13	13	Off
14	14	14	Off
15	15	15	Off
16	16	16	Off

4 IRRADIATION MEANS AND CONDITIONS

4.1 AGORFIRM/KVI irradiation facility (The Nederlands)

AGORFIRM is a facility that uses a dedicated beam line of the AGOR cyclotron for irradiations with protons in air. The facility is available for radiation damage studies. The standard proton beams used for irradiations produced by this cyclotron have primary energies of 90, 150 and 190 MeV.
The standard irradiation field has a diameter of 70 mm and homogeneity of better than ± 3%.

Figure 6: samples installed for irradiation

4.2 Energy and Flux measurement

The energy resolution of the beam when leaving the cyclotron is typically better than 0.25%. However, at the DUT position the resolution is in the order of a few MeV due to scattering in air, the scatter system and, when used, the energy degrader.
The proton flux at the centre of the irradiation field is measured with a 10 mm diameter scintillator detector. During the irradiation, the flux is monitored with a Beam Intensity Monitor (BIM). Before an irradiation the BIM signal (in Monitor Units) is related to the scintillator signal to obtain the flux calibration in protons cm^{-2} per MU. This calibration is conducted for every field size and every energy used during an irradiation.

4.3 Experimental conditions

An Equivalent total fluence of 1E12 #/cm² of 10 MeV protons is required [AD2] for this TNID (Total Non-Ionizing Dose) evaluation test. Considering NIEL (Non Ionizing Energy Loss) value for 10 MeV proton (7.86E-03 MeV cm^2 g^{-1}), total fluence to be reached at each energy is:

30	MeV	8,22E+11 cm^{-2}
60	MeV	1,14E+12 cm^{-2}
190	MeV	1,91E+12 cm^{-2}

Five steps were defined to determine the component degradation under 30MeV, 60MeV, 190MeV proton irradiation. The test devices have been exposed to the following proton fluence levels:

p/cm2	1,70E+10	8,50E+10	1,70E+11	1,70E+12
Energy (MeV)	30	30	30	30
p/cm2	2,30E+10	1,15E+11	2,30E+11	1,14E+12
Energy (MeV)	60	60	60	60
p/cm2	4,00E+10	2,00E+11	4,00E+11	1,91E+12
Energy (MeV)	190	190	190	190

5 ELECTRICAL TESTS

Electrical parameters to be measured in pre and post exposure tests are described in the following table. Electrical tests are performed on each part using the test set-up hereunder. All required data are recorded for each device. Test conditions and limits are given in the applicable irradiation test plan [AD2] and shown hereafter.

5.1 Test set-up

TEST BOARD	TRAD/CT1/N/OPTO/ZIP14/BR/1109
TEST PROGRAM	66221_TP30MeV_XXX1_B1_V10.llb 66221_TP60MeV_XXX1_B1_V10.llb 66221_TP200MeV_XXX1_B1_V10.llb

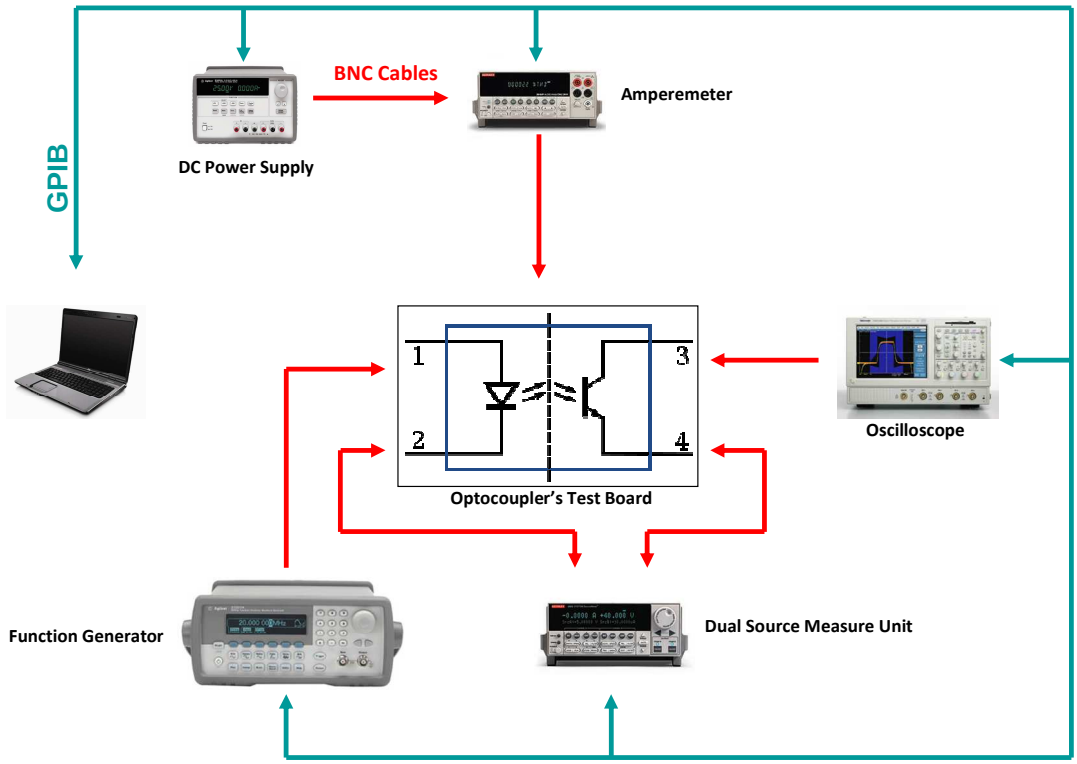


Figure 7: test configuration

5.2 Test configuration

Samples were exposed to proton irradiation in three different modes - two on-modes (Figure 8 and Figure 9) and one off-mode (all terminal leads short-circuited) –

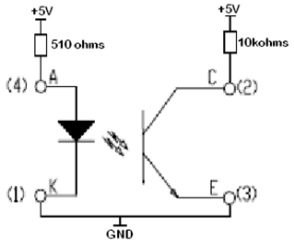


Figure 8: ON bias1

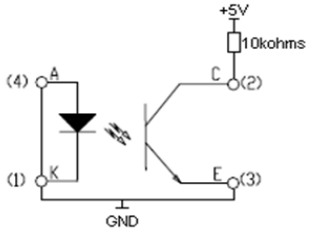


Figure 9: ON bias2

5.3 Electrical parameters

PARAMETER	SYMBOL	TEST CONDITION	MIN	MAX	UNIT
Input Diode Static Reverse Current	I_R	V_R = 6 V		8	µA
Input Diode Static Forward Voltage	V_F	I_F = 10 mA		1,6	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 100 µA, I_B = 0, I_F = 0	60		V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1 mA, I_B = 0, I_F = 0	60		V
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	I_C = 0 mA, I_E = 100 µA, I_F = 0	7		V
Off-State Collector Current	I_{CEO}	V_{CE} = 20 V, I_F = 0 mA, I_B = 0		100	nA
On State Collector Current	$I_{C(ON)}$	V_{CE} = 5 V, I_F = 1 mA, I_B=0 *	2	10	mA
Rise Time- Phototransistor Operation	tr1	V_{CC}=10V, I_F=5mA, R_L=100Ω, I_B=0		25	µs
Fall Time-Phototransistor Operation	tf1	V_{CC}=10V, I_F=5mA, R_L=100Ω, I_B=0		25	µs
Rise Time-Photodiode Operation	tr2	V_{CC}=10V, I_F=5mA, R_L=100Ω, I_E=0		3	µs
Fall Time-Photodiode Operation	tf2	V_{CC}=10V, I_F=5mA, R_L=100Ω, I_E=0		3	µs
Current Transfer Ratio	CTR1	V_{CE} = 5V, I_F = 1mA			%
	CTR2	V_{CE} = 5V, I_F = 2mA			%
	CTR3	V_{CE} = 5V, I_F = 10mA			%
	CTR4	V_{CE} = 5V, I_F = 50mA			%
	CTR5	V_{CE} = 30V, I_F = 10mA			%
Input Diode Reverse Recovery Time	Trr				ns

(*)This parameter must be measured using pulse techniques (tW = 100 µs duty cycle < 1%).

Min/ Max values are those specified in the reference data-sheet [RD1].
Test measurements are performed at 25°C ± 10°C.

6 TEST HISTORY

Test sequence and all required conditions were executed as described in the test plan.
No incident during the test was noticed.

7 SUMMARY RESULTS

7.1 30 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

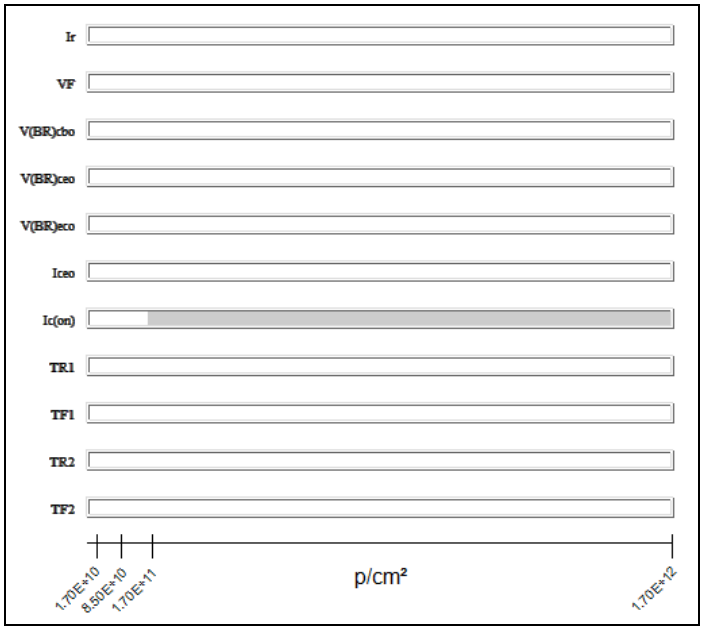


Figure 10: ON Bias 1 under 30 MeV protons

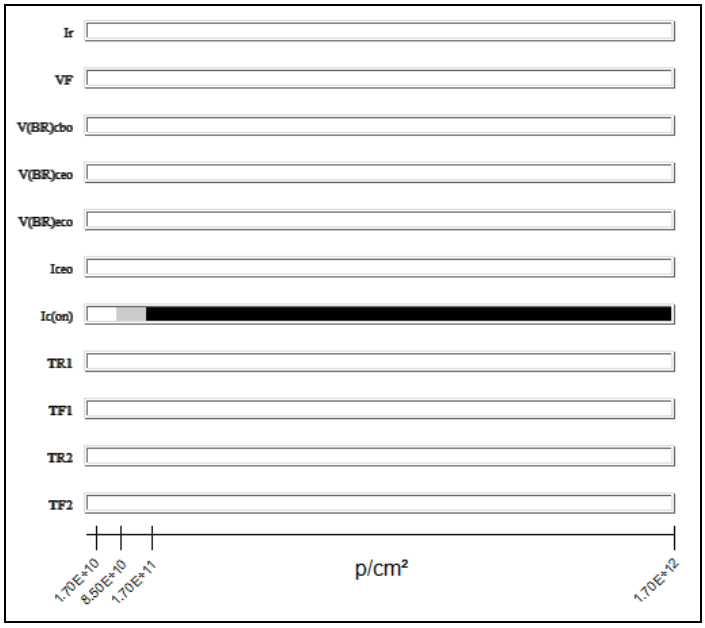


Figure 11: ON Bias 2 under 30 MeV protons

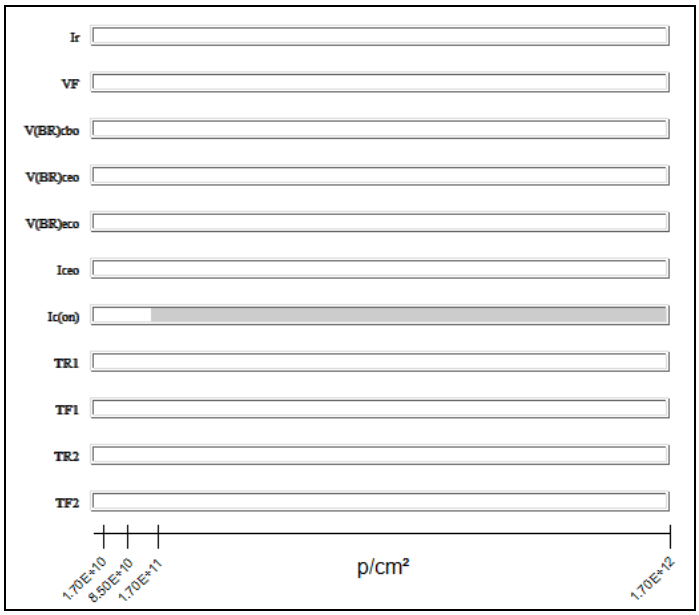
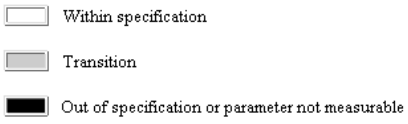


Figure 12: OFF Bias under 30 MeV protons



For all devices tested, Ic(on) is out of specification at step 1.7 E12.p/cm².

- Under the ON Bias1 condition: Ic(on) out of specification at 2.28E11.p/cm² by interpolation
- Under the ON Bias2 condition: Ic(on) out of specification at 1.42 E11.p/cm² by interpolation
- In the OFF mode: Ic(on) out of specification at 2.39 E11.p/cm² by interpolation

As shown in the Figure hereunder only one component (N°10) of the five tested with ON Bias2 condition is out of specification at step 1.7 E11.p/cm².
No correlation between Ic(on) sensitivity and bias condition can be made.

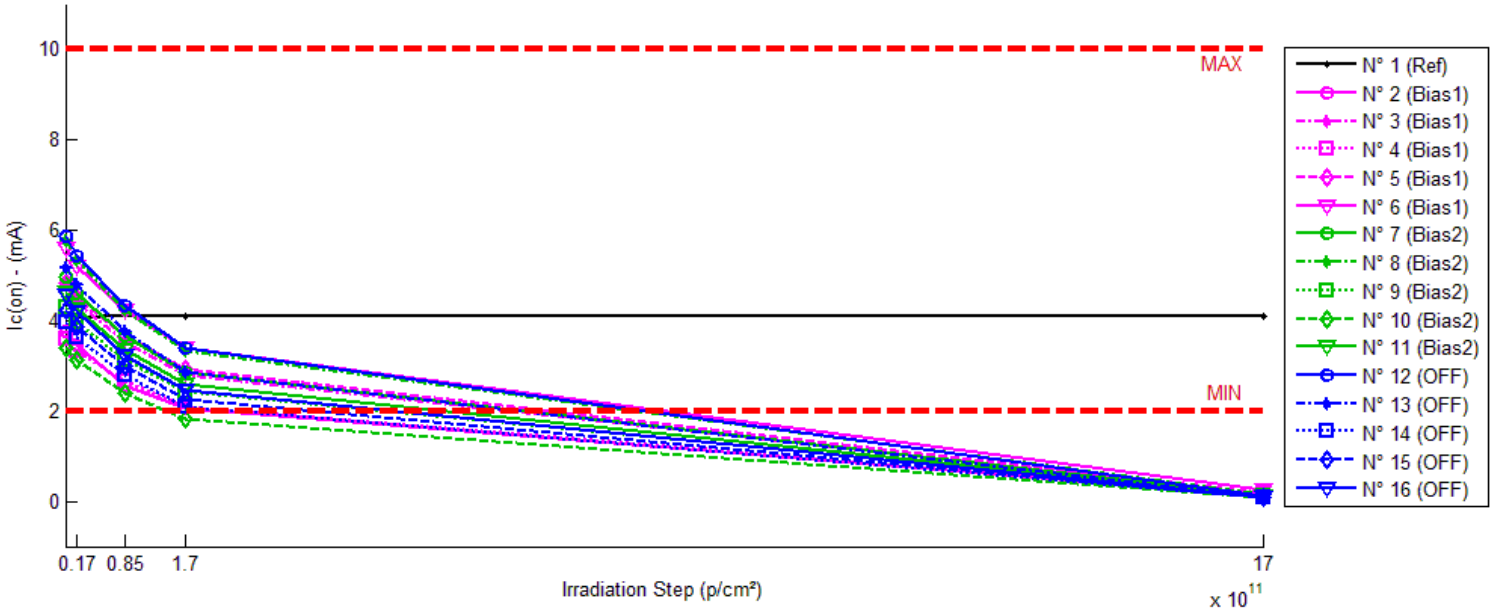


Figure 13: Ic(on) function 30 MeV proton irradiation step for each component

7.2 60 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

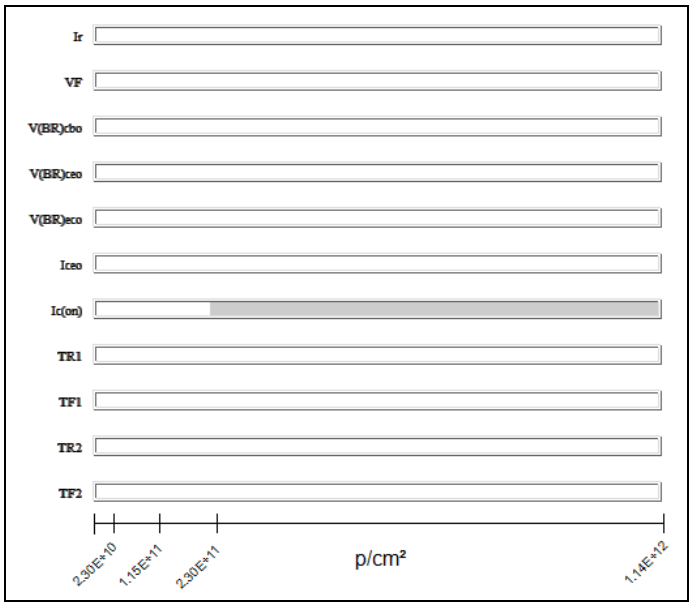


Figure 14: ON Bias 1 under 60 MeV protons

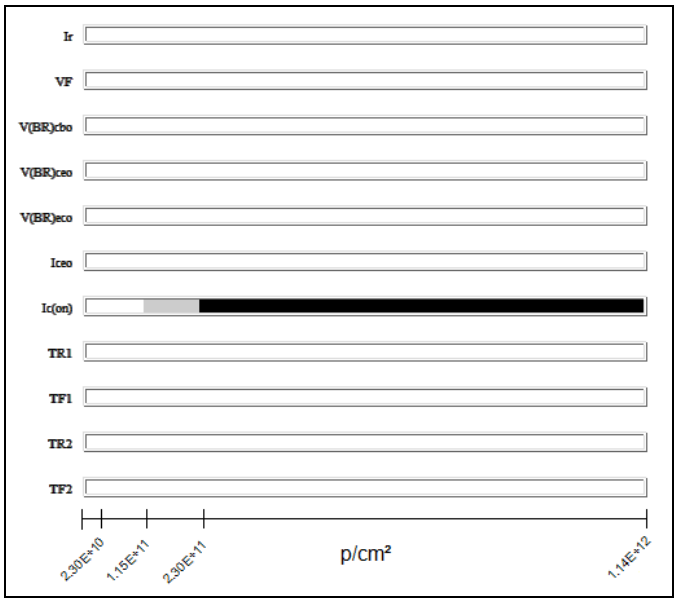


Figure 15: ON Bias 2 under 60 MeV protons

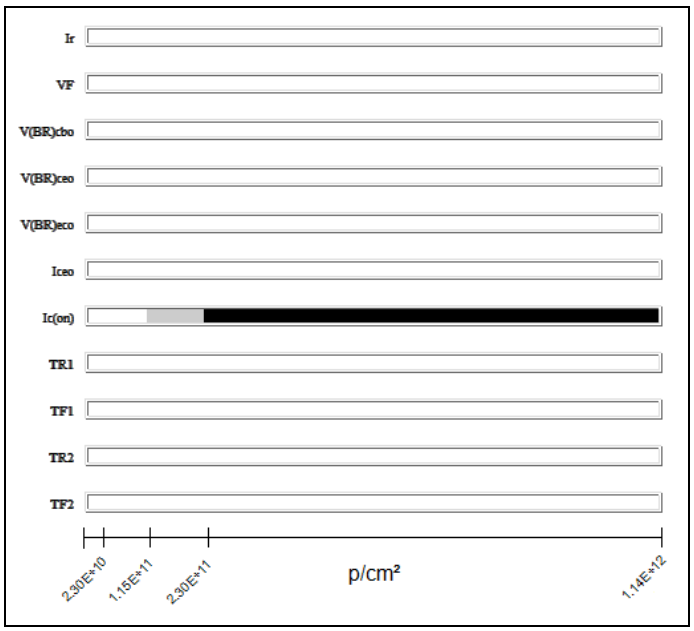


Figure 16: OFF Bias under 60 MeV protons

For all devices tested and whatever the bias conditions, Ic(on) is out of specification at step 1.14E12.p/cm².

- Under ON Bias1 conditions: Ic(on) is out of specification at 2.92 E11.p/cm² by interpolation
- Under ON Bias2 condition: Ic(on) is out of specification at 2.04 E11.p/cm² by interpolation
- In OFF mode: Ic(on) is out of specification at 2.03 E11.p/cm² by interpolation.

No correlation between Ic(on) sensitivity and bias condition can be made.

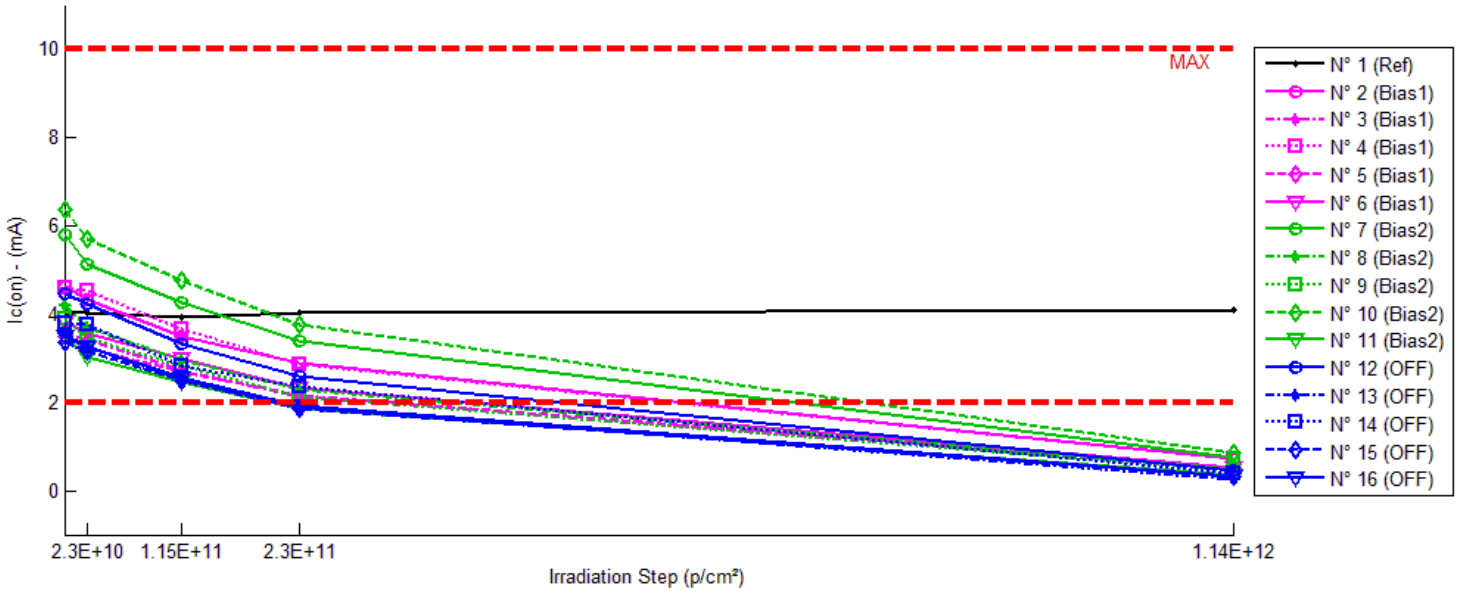


Figure 14: Ic(on) function 60 MeV proton irradiation step for each component

7.3 190 MeV proton irradiation summary results

Only the parameters with applicable test limits are shown hereunder.

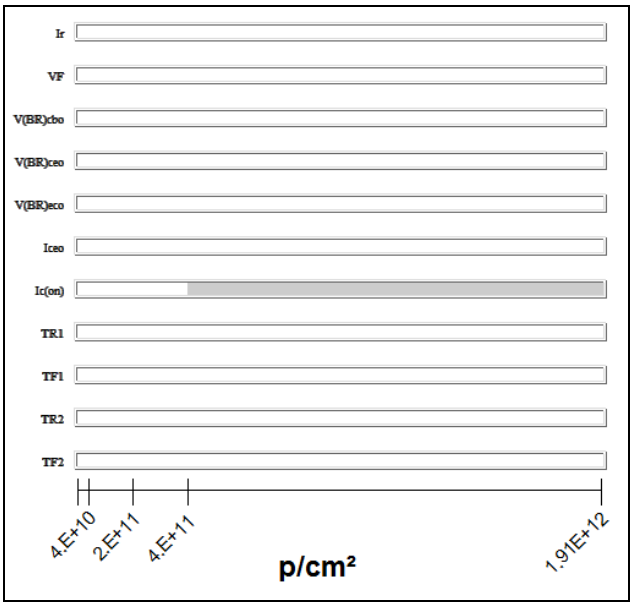


Figure 18: ON Bias 1 under 190 MeV protons

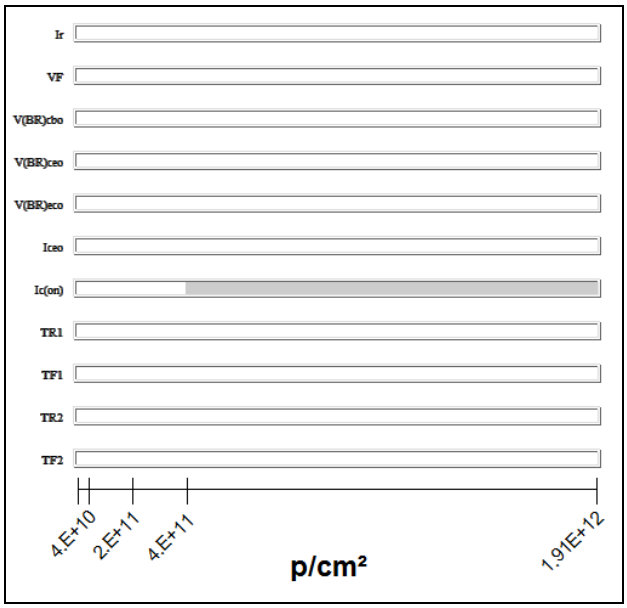
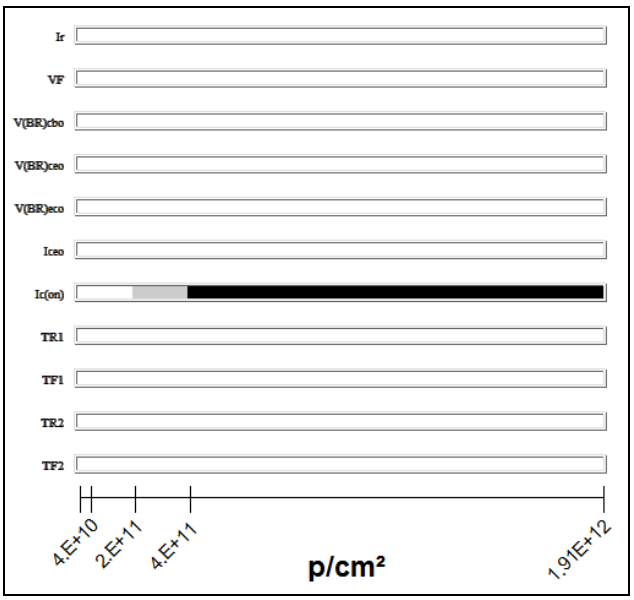


Figure 19: ON Bias 2 under 190 MeV protons



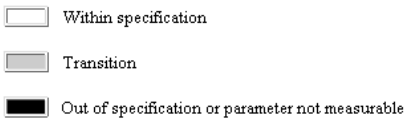


Figure 20: OFF Bias under 190 MeV protons

For all devices tested and whatever the bias condition, Ic(on) is out of specification at step 1.91E12.p/cm².

- Under ON Bias1 condition: Ic(on) is out of specification at 7.25 E11.p/cm² by interpolation
- Under ON Bias2condition: Ic(on) is out of specification at 4.25 E11.p/cm² by interpolation
- In OFF mode: Ic(on) is out of specification at 3.93 E11.p/cm² by interpolation.

No correlation between Ic(on) sensitivity and bias condition can be made.

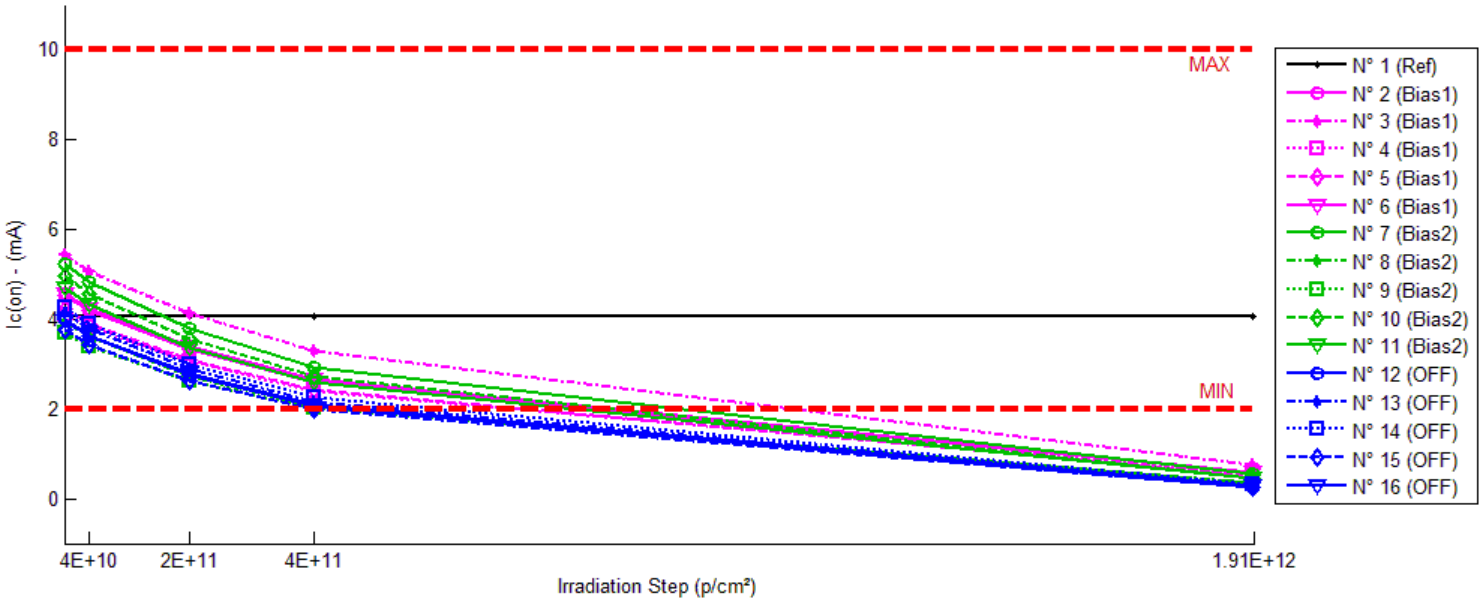


Figure 15: Ic(on) function 190 MeV proton irradiation step for each component

8 CONCLUSION

Total fluence steady-state irradiation test using protons has been applied on 66221-103, a Single Channel Optocoupler from MICROPAC**:**

- up to 1.7E+12 protons/cm², with an energy of 30 MeV
- up to 1,14E+12 protons/cm², with an energy of 60 MeV
- up to 1,91E+12 protons/cm², with an energy of 190 MeV

The results show that:

- Under 30MeV proton Beam:

All devices are functional up to 8.5 E+10 protons/cm² total fluence level.

- Under 60MeV proton Beam:

All devices are functional up to 1.15 E+11 protons/cm² total fluence level.

- Under 190MeV proton Beam:

All devices are functional up to 2 E+11 protons/cm² total fluence level.

Average drift current transfer ratio are described in next Figure depending on proton energy, CTR configuration and bias conditions at the final irradiation step.

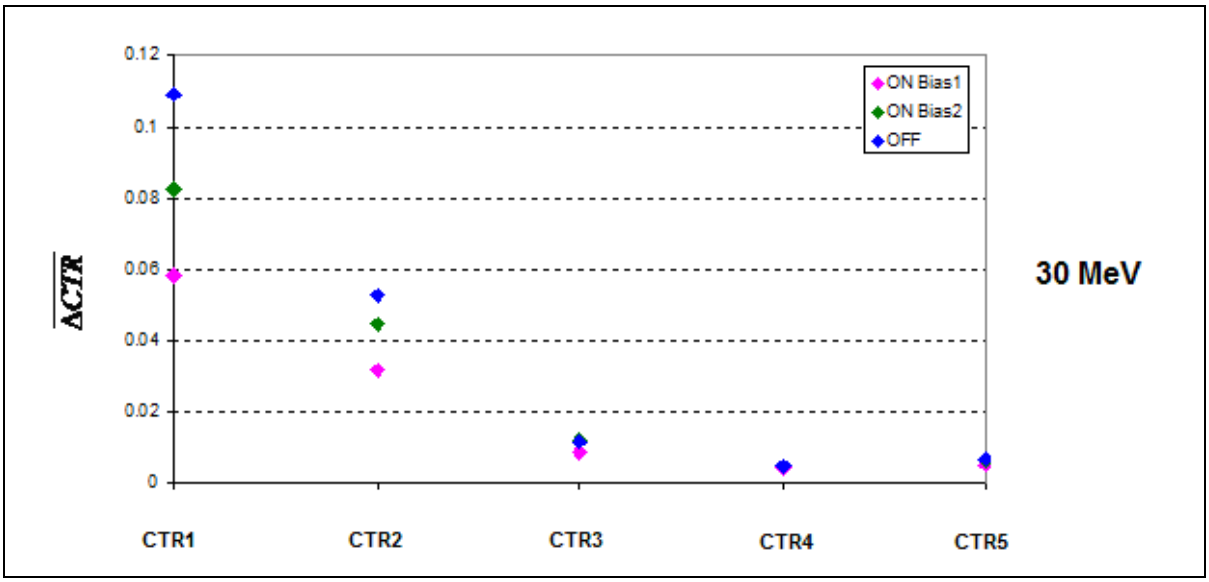


Figure 16: Average drift current transfer ratio under 30 MeV proton

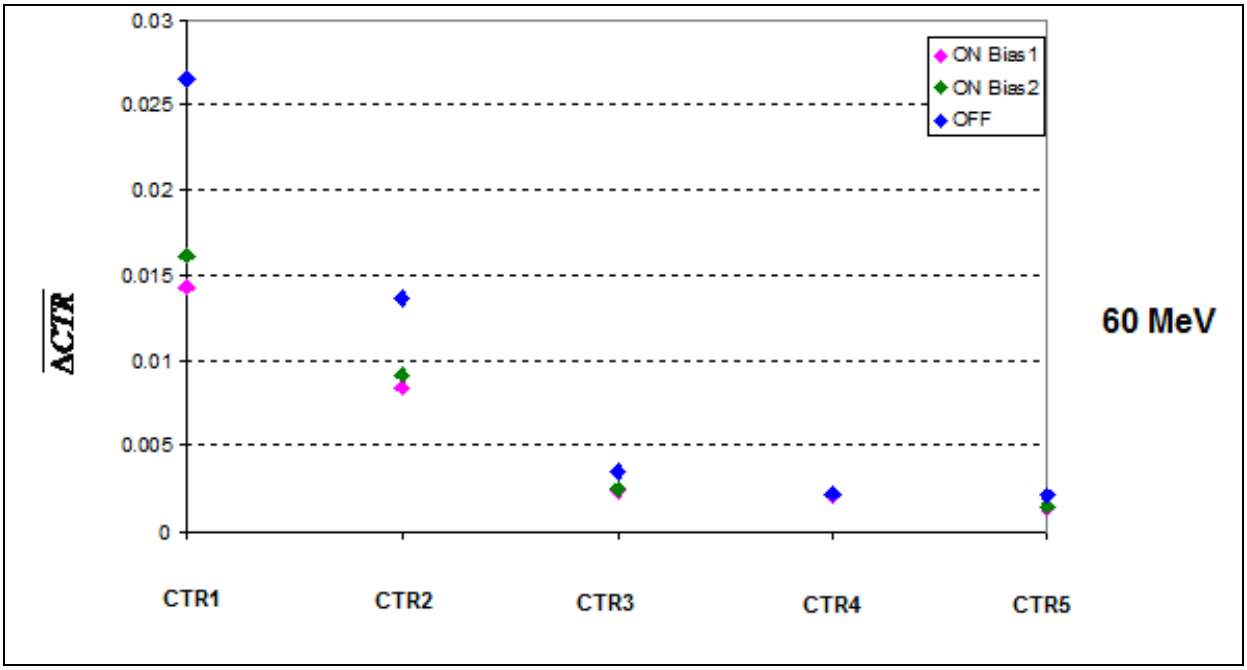


Figure 17: Average drift current transfer ratio under 60 MeV proton

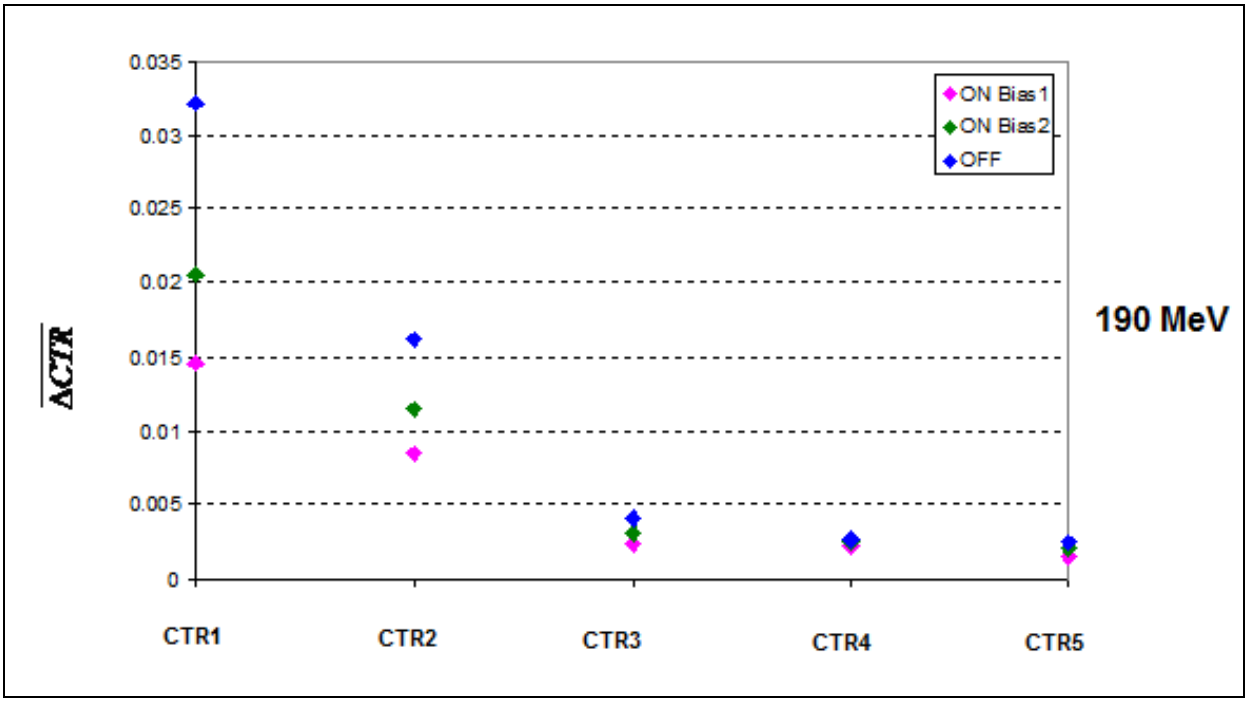


Figure 18: Average drift current transfer ratio under 190 MeV proton

CTR4 configuration (V_{CE} = 5V, I_F = 50mA) is the least sensitive configuration whatever bias conditions. Conversely, CRT1 configuration (Vce = 5V; If = 1 mA) exhibits the greatest parameter degradation.

The smallest average parameter drift for all CTR configurations is observed under the ON Bias1 configuration.

Conversely, the OFF mode is the most sensitive configuration.

9 DETAILED TESTS RESULTS

The pre and post radiation test results are shown graphically in the following pages:

- 30MeV: 9-2 to 9-35
- 60MeV: 10-2 to 10-35
- 190MeV: 11-2 to 11-35

The data is displayed in the following tables and graphs.

These graphs show parameter's shifts observed during the proton testing sequence. The Control sample results are shown on each graph (black curve).

When available in the device data-sheet/specification, the maximum/minimum/typical values are also shown (red dotted line).

The tables include drift calculation between each measurement step and the "0" protons/cm² step.

For CTR values, the formula used is:

$$\text{Drift} = \frac{1}{\text{measurement } (X \text{ protons/cm}^2)} - \frac{1}{\text{measurement } (0 \text{ protons/cm}^2)}$$

For the other measurements the formula used is:

Drift value= measurement (X protons/cm²) - measurement (0 protons/cm²)

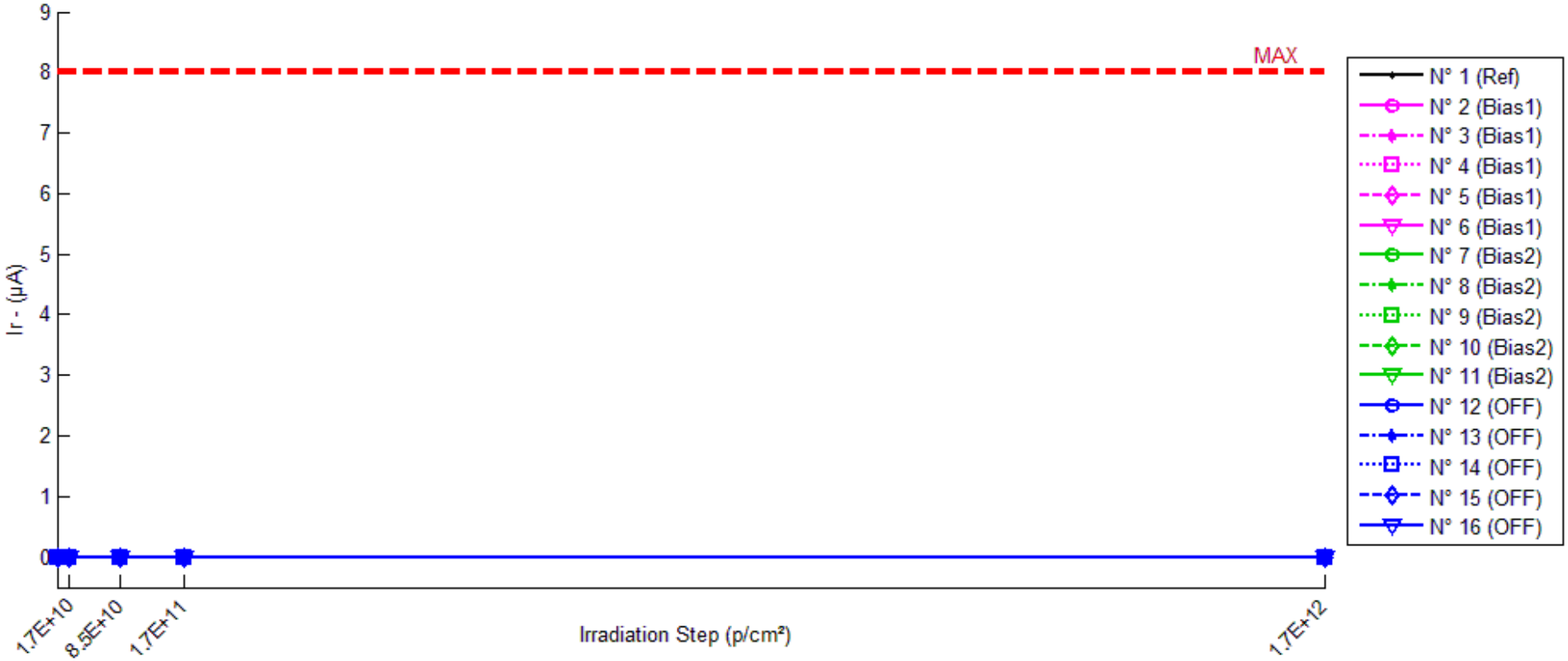
30 MeV proton / detailed results

CONTENTS

30 MeV proton / detailed results

1. Ir

Ta=25°C; VR=6V



30 MeV proton / detailed results

Ir . (µA) **Max = 8.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	7.268E-4	1.040E-3	8.612E-4	1.017E-3	9.843E-4
N° 2 (Bias1)	4.591E-5	5.887E-5	7.228E-5	9.856E-5	5.464E-4
N° 3 (Bias1)	4.965E-5	5.706E-5	8.175E-5	9.965E-5	4.463E-4
N° 4 (Bias1)	6.737E-5	6.163E-5	7.458E-5	1.016E-4	4.998E-4
N° 5 (Bias1)	4.776E-5	5.514E-5	7.902E-5	1.235E-4	5.148E-4
N° 6 (Bias1)	5.111E-5	5.975E-5	1.098E-4	1.218E-4	5.005E-4
N° 7 (Bias2)	4.797E-5	6.121E-5	1.200E-4	1.032E-4	1.035E-3
N° 8 (Bias2)	4.508E-5	6.733E-5	1.050E-4	1.397E-4	1.080E-3
N° 9 (Bias2)	4.231E-5	8.674E-5	1.056E-4	1.585E-4	1.059E-3
N° 10 (Bias2)	5.115E-5	6.842E-5	1.301E-4	1.602E-4	1.113E-3
N° 11 (Bias2)	5.157E-5	8.477E-5	1.227E-4	1.593E-4	1.202E-3
N° 12 (OFF)	5.346E-5	4.562E-5	1.090E-4	1.359E-4	6.282E-4
N° 13 (OFF)	8.016E-5	6.415E-5	1.344E-4	1.420E-4	6.659E-4
N° 14 (OFF)	4.386E-5	6.922E-5	9.768E-5	1.325E-4	6.453E-4
N° 15 (OFF)	5.086E-5	5.229E-5	9.068E-5	1.222E-4	6.681E-4
N° 16 (OFF)	4.680E-5	5.866E-5	9.713E-5	1.619E-4	6.652E-4

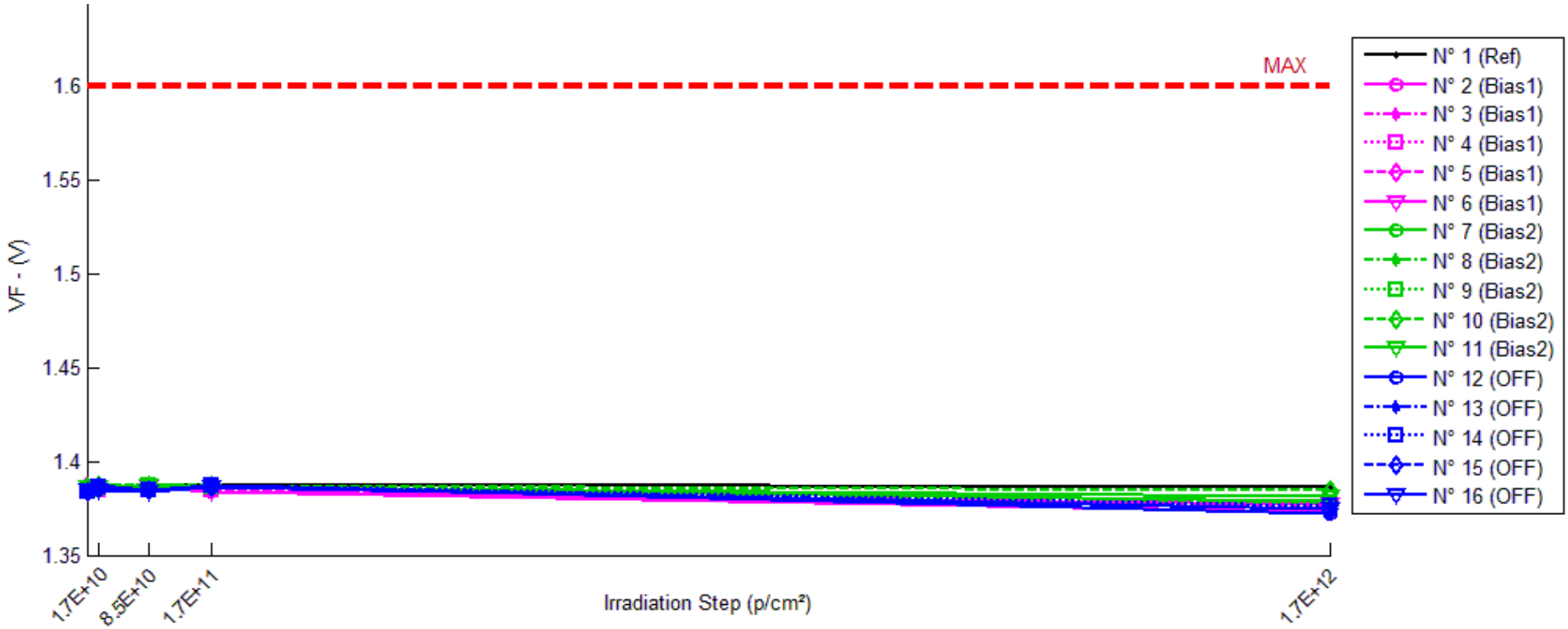
Delta [Ir]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	3.128E-4	1.344E-4	2.902E-4	2.575E-4
N° 2 (Bias1)	---	1.295E-5	2.636E-5	5.264E-5	5.004E-4
N° 3 (Bias1)	---	7.419E-6	3.210E-5	5.000E-5	3.967E-4
N° 4 (Bias1)	---	-5.742E-6	7.209E-6	3.420E-5	4.325E-4
N° 5 (Bias1)	---	7.377E-6	3.127E-5	7.573E-5	4.670E-4
N° 6 (Bias1)	---	8.634E-6	5.868E-5	7.071E-5	4.494E-4
N° 7 (Bias2)	---	1.324E-5	7.205E-5	5.520E-5	9.874E-4
N° 8 (Bias2)	---	2.225E-5	5.993E-5	9.464E-5	1.035E-3
N° 9 (Bias2)	---	4.443E-5	6.333E-5	1.162E-4	1.017E-3
N° 10 (Bias2)	---	1.727E-5	7.896E-5	1.090E-4	1.062E-3
N° 11 (Bias2)	---	3.319E-5	7.112E-5	1.077E-4	1.150E-3
N° 12 (OFF)	---	-7.836E-6	5.549E-5	8.248E-5	5.747E-4
N° 13 (OFF)	---	-1.601E-5	5.428E-5	6.182E-5	5.857E-4
N° 14 (OFF)	---	2.536E-5	5.381E-5	8.864E-5	6.014E-4
N° 15 (OFF)	---	1.425E-6	3.982E-5	7.133E-5	6.173E-4
N° 16 (OFF)	---	1.186E-5	5.034E-5	1.151E-4	6.184E-4
Average (OFF)	---	6.128E-6	3.112E-5	5.666E-5	4.492E-4
σ (OFF)	---	7.017E-6	1.840E-5	1.678E-5	3.868E-5
Average+3σ (OFF)	---	2.718E-5	8.633E-5	1.070E-4	5.652E-4
Average-3σ (OFF)	---	-1.492E-5	-2.409E-5	6.322E-6	3.332E-4
Average (Bias1)	---	2.608E-5	6.908E-5	9.656E-5	1.050E-3
σ (Bias1)	---	1.269E-5	7.540E-6	2.440E-5	6.200E-5
Average+3σ (Bias1)	---	6.415E-5	9.170E-5	1.697E-4	1.236E-3
Average-3σ (Bias1)	---	-1.200E-5	4.646E-5	2.337E-5	8.641E-4
Average (Bias2)	---	2.959E-6	5.075E-5	8.387E-5	5.995E-4
σ (Bias2)	---	1.628E-5	6.404E-6	2.027E-5	1.924E-5

30 MeV proton / detailed results

2. VF

Ta=25°C; If=10mA



30 MeV proton / detailed results

VF . (V) **Max = 1.6**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	1.388	1.387	1.386	1.388	1.386
N° 2 (Bias1)	1.387	1.386	1.386	1.384	1.373
N° 3 (Bias1)	1.388	1.386	1.386	1.386	1.377
N° 4 (Bias1)	1.384	1.385	1.385	1.385	1.377
N° 5 (Bias1)	1.386	1.386	1.385	1.385	1.376
N° 6 (Bias1)	1.386	1.386	1.386	1.384	1.377
N° 7 (Bias2)	1.386	1.385	1.388	1.386	1.379
N° 8 (Bias2)	1.386	1.387	1.387	1.386	1.378
N° 9 (Bias2)	1.385	1.386	1.387	1.386	1.378
N° 10 (Bias2)	1.386	1.387	1.387	1.387	1.385
N° 11 (Bias2)	1.386	1.386	1.387	1.386	1.381
N° 12 (OFF)	1.384	1.387	1.385	1.387	1.372
N° 13 (OFF)	1.383	1.386	1.385	1.387	1.375
N° 14 (OFF)	1.384	1.386	1.385	1.387	1.376
N° 15 (OFF)	1.384	1.386	1.385	1.386	1.375
N° 16 (OFF)	1.385	1.385	1.384	1.386	1.375

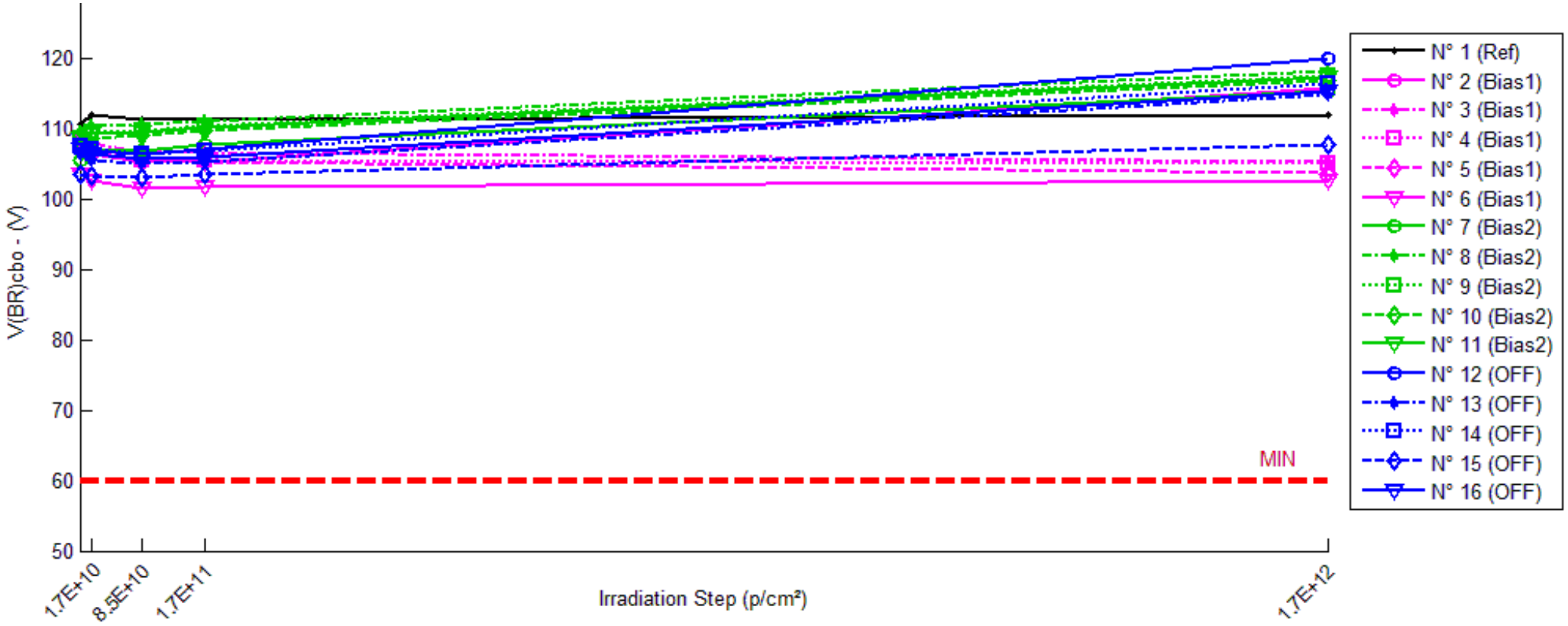
Delta [VF]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-7.340E-4	-1.900E-3	4.620E-4	-1.477E-3
N° 2 (Bias1)	---	-2.560E-4	-2.950E-4	-2.466E-3	-1.410E-2
N° 3 (Bias1)	---	-1.385E-3	-1.069E-3	-1.981E-3	-1.015E-2
N° 4 (Bias1)	---	5.750E-4	1.042E-3	1.830E-4	-7.272E-3
N° 5 (Bias1)	---	-4.290E-4	-5.470E-4	-1.468E-3	-9.595E-3
N° 6 (Bias1)	---	-4.510E-4	-4.030E-4	-1.649E-3	-8.942E-3
N° 7 (Bias2)	---	-4.470E-4	2.259E-3	-1.970E-4	-7.027E-3
N° 8 (Bias2)	---	1.098E-3	6.000E-4	-1.720E-4	-8.753E-3
N° 9 (Bias2)	---	8.060E-4	1.909E-3	1.004E-3	-6.785E-3
N° 10 (Bias2)	---	9.450E-4	1.578E-3	1.202E-3	-6.400E-4
N° 11 (Bias2)	---	4.530E-4	1.004E-3	8.080E-4	-4.790E-3
N° 12 (OFF)	---	2.317E-3	2.170E-4	2.537E-3	-1.252E-2
N° 13 (OFF)	---	2.654E-3	1.646E-3	3.809E-3	-7.528E-3
N° 14 (OFF)	---	2.268E-3	1.209E-3	3.219E-3	-7.360E-3
N° 15 (OFF)	---	1.186E-3	3.400E-4	1.325E-3	-9.882E-3
N° 16 (OFF)	---	2.530E-4	-7.560E-4	5.630E-4	-1.066E-2
Average (OFF)	---	-3.892E-4	-2.544E-4	-1.476E-3	-1.001E-2
σ (OFF)	---	6.972E-4	7.832E-4	1.002E-3	2.528E-3
Average+3σ (OFF)	---	1.702E-3	2.095E-3	1.530E-3	-2.428E-3
Average-3σ (OFF)	---	-2.481E-3	-2.604E-3	-4.483E-3	-1.759E-2
Average (Bias1)	---	5.710E-4	1.470E-3	5.290E-4	-5.599E-3
σ (Bias1)	---	6.171E-4	6.710E-4	6.661E-4	3.108E-3
Average+3σ (Bias1)	---	2.422E-3	3.483E-3	2.527E-3	3.725E-3
Average-3σ (Bias1)	---	-1.280E-3	-5.430E-4	-1.469E-3	-1.492E-2
Average (Bias2)	---	1.736E-3	5.312E-4	2.291E-3	-9.589E-3
σ (Bias2)	---	9.956E-4	9.347E-4	1.337E-3	2.181E-3
Average+3σ (Bias2)	---	4.722E-3	3.335E-3	6.300E-3	-3.047E-3
Average-3σ (Bias2)	---	-1.251E-3	-2.273E-3	-1.719E-3	-1.613E-2

30 MeV proton / detailed results

3. V(BR)cbo

Ta=25°C; Ic=100µA; Ib=0; If=0



30 MeV proton / detailed results

V(BR)cbo . (V) **Min = 60.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	110.80	112.14	111.30	111.42	111.97
N° 2 (Bias1)	107.98	106.47	105.27	105.48	115.87
N° 3 (Bias1)	109.43	108.15	106.79	106.81	105.40
N° 4 (Bias1)	108.32	106.92	105.69	105.69	105.09
N° 5 (Bias1)	108.20	106.82	105.41	105.43	103.85
N° 6 (Bias1)	103.62	102.67	101.54	101.82	102.63
N° 7 (Bias2)	105.65	106.86	107.01	107.76	115.35
N° 8 (Bias2)	109.56	110.42	110.75	111.26	118.37
N° 9 (Bias2)	108.74	109.63	109.91	110.49	117.60
N° 10 (Bias2)	107.39	108.83	109.18	109.76	117.04
N° 11 (Bias2)	108.81	109.48	109.64	110.19	117.34
N° 12 (OFF)	107.77	107.00	106.60	107.05	120.12
N° 13 (OFF)	106.47	105.67	105.05	105.36	114.97
N° 14 (OFF)	107.65	107.05	106.57	106.97	116.41
N° 15 (OFF)	103.70	103.41	103.25	103.67	107.90
N° 16 (OFF)	107.11	106.42	105.82	106.09	115.35

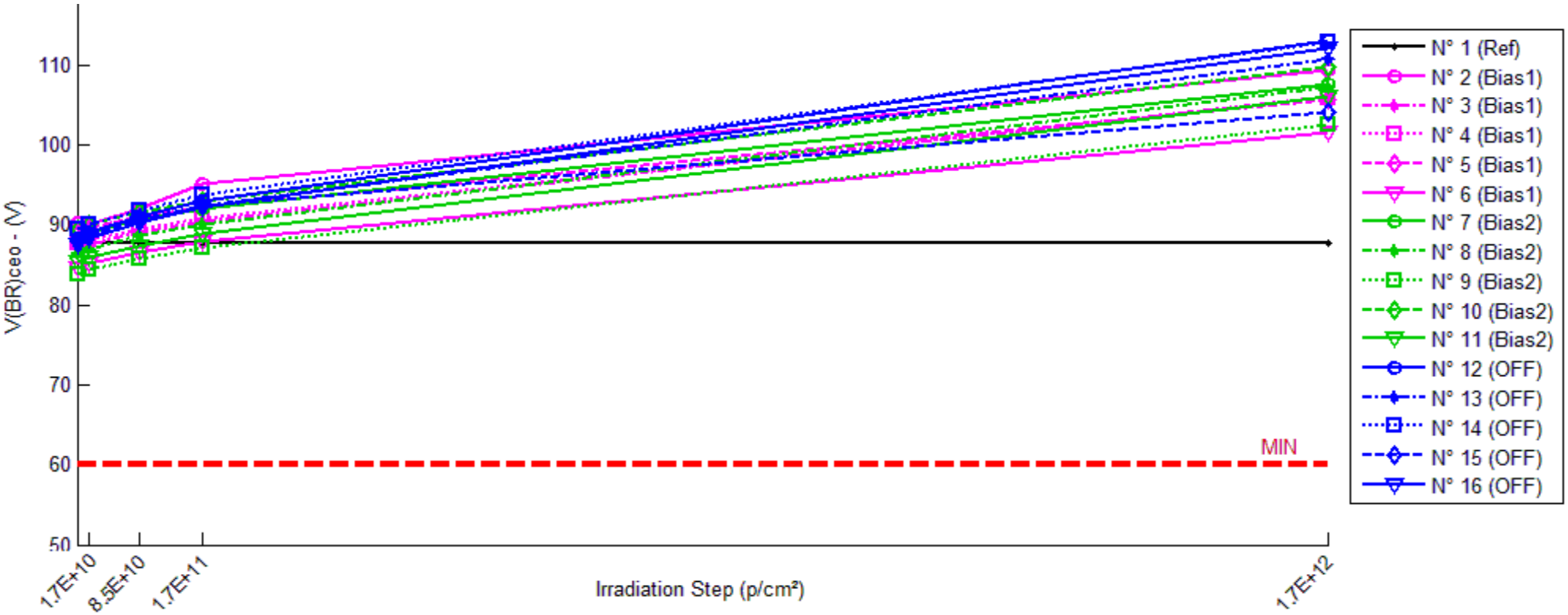
Delta [V(BR)cbo]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.337E+0	4.979E-1	6.146E-1	1.166E+0
N° 2 (Bias1)	---	-1.510E+0	-2.710E+0	-2.502E+0	7.894E+0
N° 3 (Bias1)	---	-1.285E+0	-2.645E+0	-2.628E+0	-4.030E+0
N° 4 (Bias1)	---	-1.395E+0	-2.632E+0	-2.628E+0	-3.234E+0
N° 5 (Bias1)	---	-1.374E+0	-2.787E+0	-2.768E+0	-4.353E+0
N° 6 (Bias1)	---	-9.429E-1	-2.075E+0	-1.801E+0	-9.888E-1
N° 7 (Bias2)	---	1.206E+0	1.356E+0	2.112E+0	9.699E+0
N° 8 (Bias2)	---	8.625E-1	1.193E+0	1.702E+0	8.806E+0
N° 9 (Bias2)	---	8.843E-1	1.167E+0	1.749E+0	8.853E+0
N° 10 (Bias2)	---	1.438E+0	1.786E+0	2.369E+0	9.653E+0
N° 11 (Bias2)	---	6.718E-1	8.325E-1	1.373E+0	8.531E+0
N° 12 (OFF)	---	-7.698E-1	-1.169E+0	-7.163E-1	1.235E+1
N° 13 (OFF)	---	-7.939E-1	-1.412E+0	-1.102E+0	8.506E+0
N° 14 (OFF)	---	-5.985E-1	-1.081E+0	-6.868E-1	8.758E+0
N° 15 (OFF)	---	-2.961E-1	-4.470E-1	-2.760E-2	4.196E+0
N° 16 (OFF)	---	-6.927E-1	-1.291E+0	-1.014E+0	8.242E+0
Average (OFF)	---	-1.301E+0	-2.570E+0	-2.465E+0	-9.425E-1
σ (OFF)	---	2.159E-1	2.834E-1	3.833E-1	5.111E+0
Average+3σ (OFF)	---	-6.537E-1	-1.720E+0	-1.315E+0	1.439E+1
Average-3σ (OFF)	---	-1.949E+0	-3.420E+0	-3.615E+0	-1.628E+1
Average (Bias1)	---	1.013E+0	1.267E+0	1.861E+0	9.108E+0
σ (Bias1)	---	3.058E-1	3.472E-1	3.861E-1	5.326E-1
Average+3σ (Bias1)	---	1.930E+0	2.309E+0	3.019E+0	1.071E+1
Average-3σ (Bias1)	---	9.535E-2	2.256E-1	7.026E-1	7.511E+0
Average (Bias2)	---	-6.302E-1	-1.080E+0	-7.094E-1	8.410E+0
σ (Bias2)	---	2.018E-1	3.754E-1	4.220E-1	2.891E+0
Average+3σ (Bias2)	---	-2.494E-2	4.604E-2	5.567E-1	1.708E+1
Average-3σ (Bias2)	---	-1.235E+0	-2.206E+0	-1.976E+0	-2.623E-1

30 MeV proton / detailed results

4. V(BR)ceo

Ta=25°C; Ic=1mA; Ib=0; If=0



30 MeV proton / detailed results

V(BR)ceo . (V) **Min = 60.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	87.7	87.7	87.8	87.7	87.8
N° 2 (Bias1)	90.2	90.0	92.1	95.2	109.3
N° 3 (Bias1)	86.9	87.6	89.0	90.4	106.1
N° 4 (Bias1)	87.7	88.2	89.5	90.9	105.8
N° 5 (Bias1)	89.0	89.7	91.0	92.3	105.7
N° 6 (Bias1)	84.7	85.2	86.6	87.9	101.5
N° 7 (Bias2)	88.4	89.1	90.6	92.1	107.7
N° 8 (Bias2)	86.4	87.0	88.7	90.1	107.3
N° 9 (Bias2)	83.8	84.4	85.8	87.1	102.6
N° 10 (Bias2)	89.4	90.1	91.6	93.0	109.8
N° 11 (Bias2)	85.3	86.0	87.4	88.9	106.0
N° 12 (OFF)	88.4	89.1	91.0	92.9	113.1
N° 13 (OFF)	87.8	88.5	90.3	92.4	110.8
N° 14 (OFF)	89.4	90.1	91.9	93.8	112.8
N° 15 (OFF)	88.0	88.8	90.6	92.5	104.2
N° 16 (OFF)	87.6	88.3	90.2	92.2	112.1

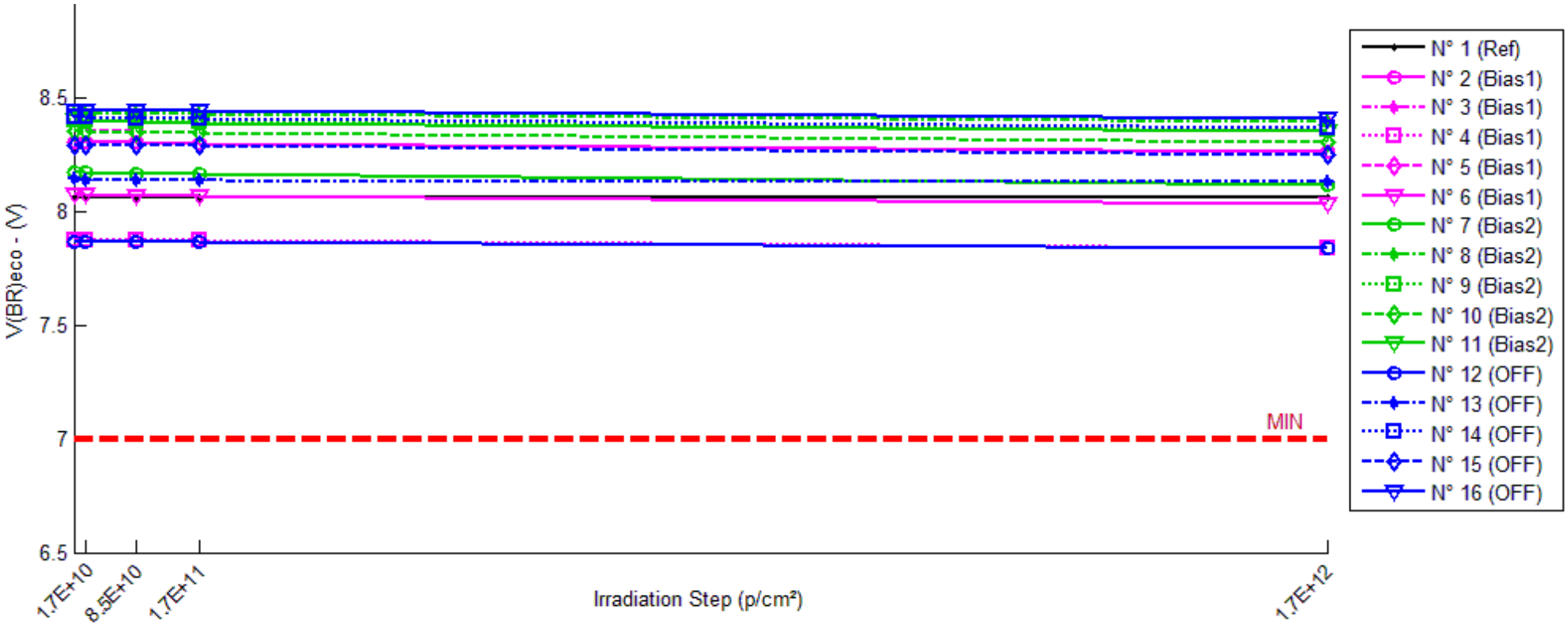
Delta [V(BR)ceo]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.010E-2	2.650E-2	9.150E-3	2.515E-2
N° 2 (Bias1)	---	-2.138E-1	1.897E+0	4.981E+0	1.905E+1
N° 3 (Bias1)	---	6.936E-1	2.103E+0	3.511E+0	1.924E+1
N° 4 (Bias1)	---	5.325E-1	1.873E+0	3.213E+0	1.814E+1
N° 5 (Bias1)	---	6.201E-1	1.905E+0	3.201E+0	1.667E+1
N° 6 (Bias1)	---	5.641E-1	1.972E+0	3.259E+0	1.683E+1
N° 7 (Bias2)	---	7.530E-1	2.251E+0	3.749E+0	1.937E+1
N° 8 (Bias2)	---	6.729E-1	2.298E+0	3.695E+0	2.094E+1
N° 9 (Bias2)	---	5.967E-1	1.930E+0	3.260E+0	1.873E+1
N° 10 (Bias2)	---	6.516E-1	2.214E+0	3.573E+0	2.038E+1
N° 11 (Bias2)	---	6.808E-1	2.158E+0	3.579E+0	2.074E+1
N° 12 (OFF)	---	7.260E-1	2.576E+0	4.499E+0	2.472E+1
N° 13 (OFF)	---	6.699E-1	2.471E+0	4.512E+0	2.300E+1
N° 14 (OFF)	---	6.972E-1	2.494E+0	4.348E+0	2.340E+1
N° 15 (OFF)	---	7.721E-1	2.554E+0	4.518E+0	1.622E+1
N° 16 (OFF)	---	7.623E-1	2.668E+0	4.601E+0	2.456E+1
Average (OFF)	---	4.393E-1	1.950E+0	3.633E+0	1.799E+1
σ (OFF)	---	3.702E-1	9.301E-2	7.638E-1	1.205E+0
Average+3σ (OFF)	---	1.550E+0	2.229E+0	5.924E+0	2.160E+1
Average-3σ (OFF)	---	-6.713E-1	1.671E+0	1.341E+0	1.437E+1
Average (Bias1)	---	6.710E-1	2.170E+0	3.571E+0	2.003E+1
σ (Bias1)	---	5.641E-2	1.437E-1	1.897E-1	9.453E-1
Average+3σ (Bias1)	---	8.402E-1	2.601E+0	4.140E+0	2.287E+1
Average-3σ (Bias1)	---	5.018E-1	1.739E+0	3.002E+0	1.719E+1
Average (Bias2)	---	7.255E-1	2.553E+0	4.496E+0	2.238E+1
σ (Bias2)	---	4.307E-2	7.740E-2	9.189E-2	3.520E+0
Average+3σ (Bias2)	---	8.547E-1	2.785E+0	4.771E+0	3.294E+1
Average-3σ (Bias2)	---	5.963E-1	2.320E+0	4.220E+0	1.182E+1

30 MeV proton / detailed results

5. V(BR)eco

Ta=25°C; Ic=0; Ie=100µA; If=0



30 MeV proton / detailed results

V(BR)eco . (V) **Min = 7.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	8.064	8.066	8.066	8.066	8.066
N° 2 (Bias1)	8.306	8.305	8.304	8.301	8.262
N° 3 (Bias1)	8.437	8.437	8.435	8.435	8.407
N° 4 (Bias1)	7.876	7.875	7.873	7.873	7.843
N° 5 (Bias1)	8.359	8.359	8.354	8.350	8.308
N° 6 (Bias1)	8.074	8.074	8.072	8.072	8.038
N° 7 (Bias2)	8.175	8.175	8.170	8.165	8.119
N° 8 (Bias2)	8.437	8.436	8.435	8.431	8.396
N° 9 (Bias2)	8.403	8.402	8.400	8.398	8.364
N° 10 (Bias2)	8.356	8.354	8.351	8.346	8.304
N° 11 (Bias2)	8.402	8.401	8.398	8.393	8.356
N° 12 (OFF)	7.867	7.866	7.866	7.865	7.840
N° 13 (OFF)	8.146	8.143	8.142	8.142	8.130
N° 14 (OFF)	8.420	8.417	8.415	8.409	8.368
N° 15 (OFF)	8.296	8.295	8.295	8.294	8.254
N° 16 (OFF)	8.449	8.448	8.447	8.446	8.412

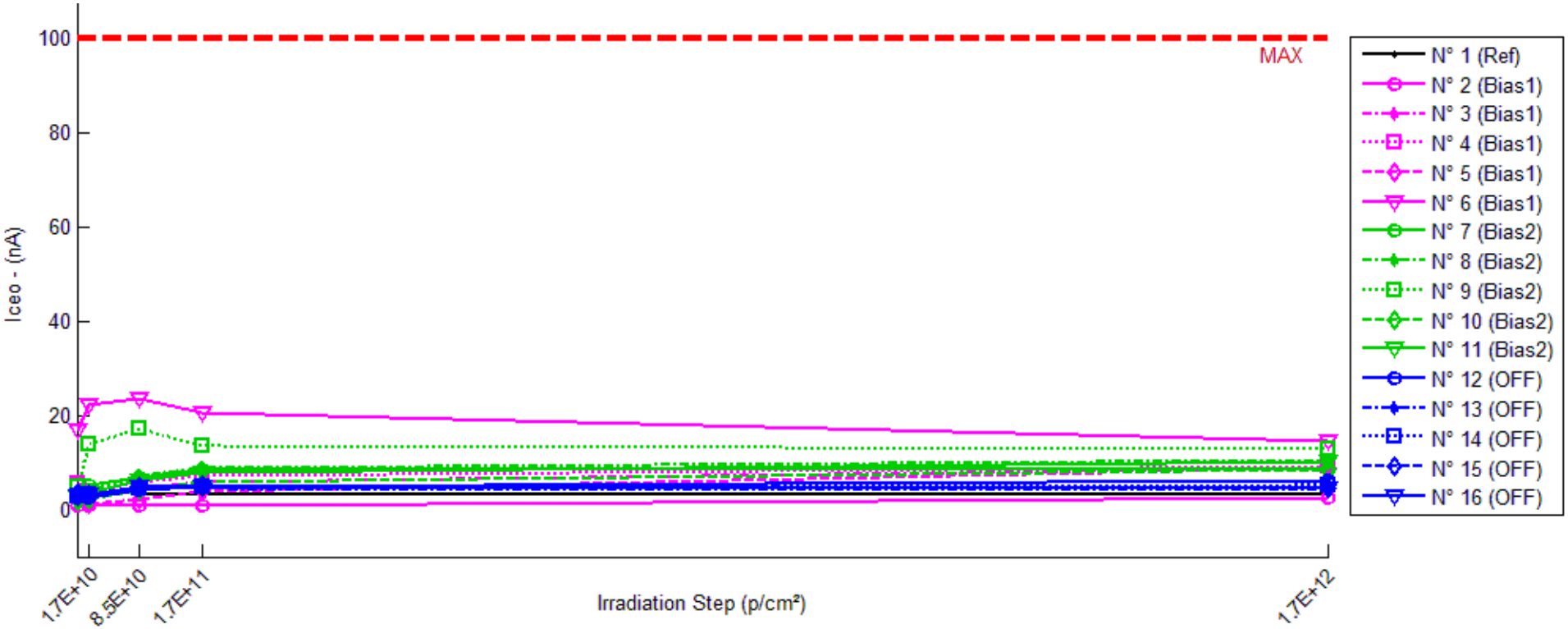
Delta [V(BR)eco]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.325E-3	1.885E-3	1.523E-3	2.488E-3
N° 2 (Bias1)	---	-7.360E-4	-2.041E-3	-4.736E-3	-4.377E-2
N° 3 (Bias1)	---	7.160E-4	-1.484E-3	-2.029E-3	-2.992E-2
N° 4 (Bias1)	---	-9.920E-4	-3.015E-3	-3.463E-3	-3.290E-2
N° 5 (Bias1)	---	-3.880E-4	-4.882E-3	-8.863E-3	-5.149E-2
N° 6 (Bias1)	---	-2.800E-5	-1.419E-3	-2.101E-3	-3.627E-2
N° 7 (Bias2)	---	-2.000E-6	-5.504E-3	-1.008E-2	-5.606E-2
N° 8 (Bias2)	---	-1.318E-3	-2.628E-3	-6.550E-3	-4.146E-2
N° 9 (Bias2)	---	-7.630E-4	-2.619E-3	-5.090E-3	-3.861E-2
N° 10 (Bias2)	---	-1.386E-3	-4.887E-3	-9.338E-3	-5.108E-2
N° 11 (Bias2)	---	-8.480E-4	-4.439E-3	-8.770E-3	-4.594E-2
N° 12 (OFF)	---	-4.060E-4	-7.300E-5	-1.712E-3	-2.617E-2
N° 13 (OFF)	---	-2.725E-3	-3.608E-3	-4.310E-3	-1.642E-2
N° 14 (OFF)	---	-2.921E-3	-5.382E-3	-1.062E-2	-5.218E-2
N° 15 (OFF)	---	-1.153E-3	-8.770E-4	-2.155E-3	-4.261E-2
N° 16 (OFF)	---	-8.820E-4	-1.961E-3	-3.452E-3	-3.709E-2
Average (OFF)	---	-2.856E-4	-2.568E-3	-4.238E-3	-3.887E-2
σ (OFF)	---	6.674E-4	1.443E-3	2.815E-3	8.744E-3
Average+3σ (OFF)	---	1.717E-3	1.760E-3	4.205E-3	-1.264E-2
Average-3σ (OFF)	---	-2.288E-3	-6.897E-3	-1.268E-2	-6.510E-2
Average (Bias1)	---	-8.634E-4	-4.015E-3	-7.966E-3	-4.663E-2
σ (Bias1)	---	5.550E-4	1.326E-3	2.079E-3	7.076E-3
Average+3σ (Bias1)	---	8.016E-4	-3.832E-5	-1.730E-3	-2.540E-2
Average-3σ (Bias1)	---	-2.528E-3	-7.992E-3	-1.420E-2	-6.786E-2
Average (Bias2)	---	-1.617E-3	-2.380E-3	-4.450E-3	-3.490E-2
σ (Bias2)	---	1.135E-3	2.138E-3	3.602E-3	1.397E-2
Average+3σ (Bias2)	---	1.787E-3	4.033E-3	6.354E-3	7.013E-3
Average-3σ (Bias2)	---	-5.021E-3	-8.793E-3	-1.526E-2	-7.681E-2

30 MeV proton / detailed results

6. Iceo

Ta=25°C; Vce=20V; If=0; Ib=0



30 MeV proton / detailed results

Iceo . (nA) **Max = 100.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	2.802	3.840	3.393	3.225	3.601
N° 2 (Bias1)	0.828	0.811	0.855	0.928	2.515
N° 3 (Bias1)	2.544	2.865	4.380	5.800	8.962
N° 4 (Bias1)	5.506	3.933	5.898	7.108	9.231
N° 5 (Bias1)	2.034	1.068	2.350	3.744	8.801
N° 6 (Bias1)	16.835	22.335	23.748	20.490	14.678
N° 7 (Bias2)	2.931	5.084	7.009	8.643	8.498
N° 8 (Bias2)	3.239	4.080	7.119	8.842	10.548
N° 9 (Bias2)	4.989	14.014	17.371	13.429	13.040
N° 10 (Bias2)	1.900	2.183	4.093	5.770	8.474
N° 11 (Bias2)	2.652	3.377	6.111	7.772	10.316
N° 12 (OFF)	2.489	2.579	4.209	4.791	6.119
N° 13 (OFF)	2.171	2.645	4.594	4.647	4.302
N° 14 (OFF)	2.705	3.072	4.470	4.709	5.330
N° 15 (OFF)	3.414	3.225	4.830	5.207	4.483
N° 16 (OFF)	2.953	3.073	4.922	5.007	4.653

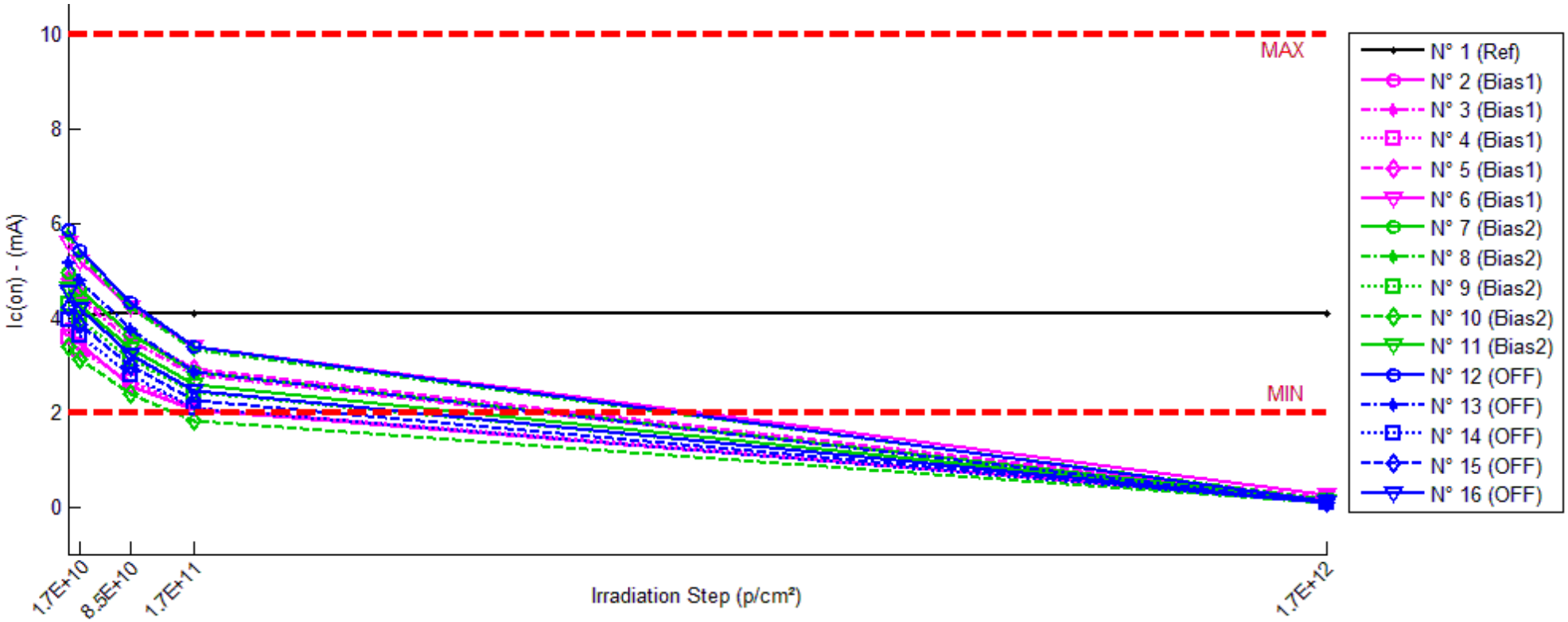
Delta [Iceo]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	1.038E+0	5.907E-1	4.223E-1	7.982E-1
N° 2 (Bias1)	---	-1.673E-2	2.665E-2	1.000E-1	1.687E+0
N° 3 (Bias1)	---	3.218E-1	1.837E+0	3.257E+0	6.418E+0
N° 4 (Bias1)	---	-1.573E+0	3.924E-1	1.602E+0	3.725E+0
N° 5 (Bias1)	---	-9.664E-1	3.165E-1	1.710E+0	6.767E+0
N° 6 (Bias1)	---	5.500E+0	6.913E+0	3.655E+0	-2.158E+0
N° 7 (Bias2)	---	2.152E+0	4.078E+0	5.712E+0	5.567E+0
N° 8 (Bias2)	---	8.404E-1	3.879E+0	5.603E+0	7.308E+0
N° 9 (Bias2)	---	9.025E+0	1.238E+1	8.440E+0	8.051E+0
N° 10 (Bias2)	---	2.827E-1	2.193E+0	3.870E+0	6.574E+0
N° 11 (Bias2)	---	7.250E-1	3.459E+0	5.120E+0	7.664E+0
N° 12 (OFF)	---	8.933E-2	1.719E+0	2.302E+0	3.630E+0
N° 13 (OFF)	---	4.739E-1	2.423E+0	2.475E+0	2.131E+0
N° 14 (OFF)	---	3.663E-1	1.765E+0	2.004E+0	2.624E+0
N° 15 (OFF)	---	-1.899E-1	1.415E+0	1.792E+0	1.068E+0
N° 16 (OFF)	---	1.191E-1	1.968E+0	2.053E+0	1.699E+0
Average (OFF)	---	6.530E-1	1.897E+0	2.065E+0	3.288E+0
σ (OFF)	---	2.812E+0	2.890E+0	1.427E+0	3.685E+0
Average+3σ (OFF)	---	9.088E+0	1.057E+1	6.347E+0	1.434E+1
Average-3σ (OFF)	---	-7.782E+0	-6.775E+0	-2.217E+0	-7.767E+0
Average (Bias1)	---	2.605E+0	5.198E+0	5.749E+0	7.033E+0
σ (Bias1)	---	3.656E+0	4.082E+0	1.673E+0	9.837E-1
Average+3σ (Bias1)	---	1.357E+1	1.745E+1	1.077E+1	9.984E+0
Average-3σ (Bias1)	---	-8.363E+0	-7.049E+0	7.307E-1	4.082E+0
Average (Bias2)	---	1.717E-1	1.858E+0	2.125E+0	2.231E+0
σ (Bias2)	---	2.596E-1	3.725E-1	2.667E-1	9.689E-1
Average+3σ (Bias2)	---	9.504E-1	2.975E+0	2.925E+0	5.137E+0
Average-3σ (Bias2)	---	-6.070E-1	7.406E-1	1.325E+0	-6.761E-1

30 MeV proton / detailed results

7. Ic(on)

Ta=25°C;Vce=5V; If=1mA; Ib=0



30 MeV proton / detailed results

Ic(on) . (mA) **Min = 2.0 Max = 10.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	4.160	4.059	4.128	4.107	4.111
N° 2 (Bias1)	3.776	3.470	2.573	2.074	0.115
N° 3 (Bias1)	4.758	4.388	3.536	2.782	0.169
N° 4 (Bias1)	3.598	3.337	2.665	2.096	0.139
N° 5 (Bias1)	4.817	4.491	3.657	2.924	0.200
N° 6 (Bias1)	5.596	5.214	4.221	3.383	0.254
N° 7 (Bias2)	4.974	4.591	3.654	2.866	0.119
N° 8 (Bias2)	5.765	5.337	4.236	3.331	0.161
N° 9 (Bias2)	4.298	3.959	3.114	2.430	0.129
N° 10 (Bias2)	3.386	3.112	2.378	1.813	0.074
N° 11 (Bias2)	4.646	4.280	3.356	2.600	0.118
N° 12 (OFF)	5.860	5.449	4.330	3.382	0.136
N° 13 (OFF)	5.182	4.806	3.779	2.870	0.090
N° 14 (OFF)	3.949	3.625	2.799	2.090	0.076
N° 15 (OFF)	4.227	3.874	2.997	2.247	0.070
N° 16 (OFF)	4.576	4.196	3.243	2.461	0.080

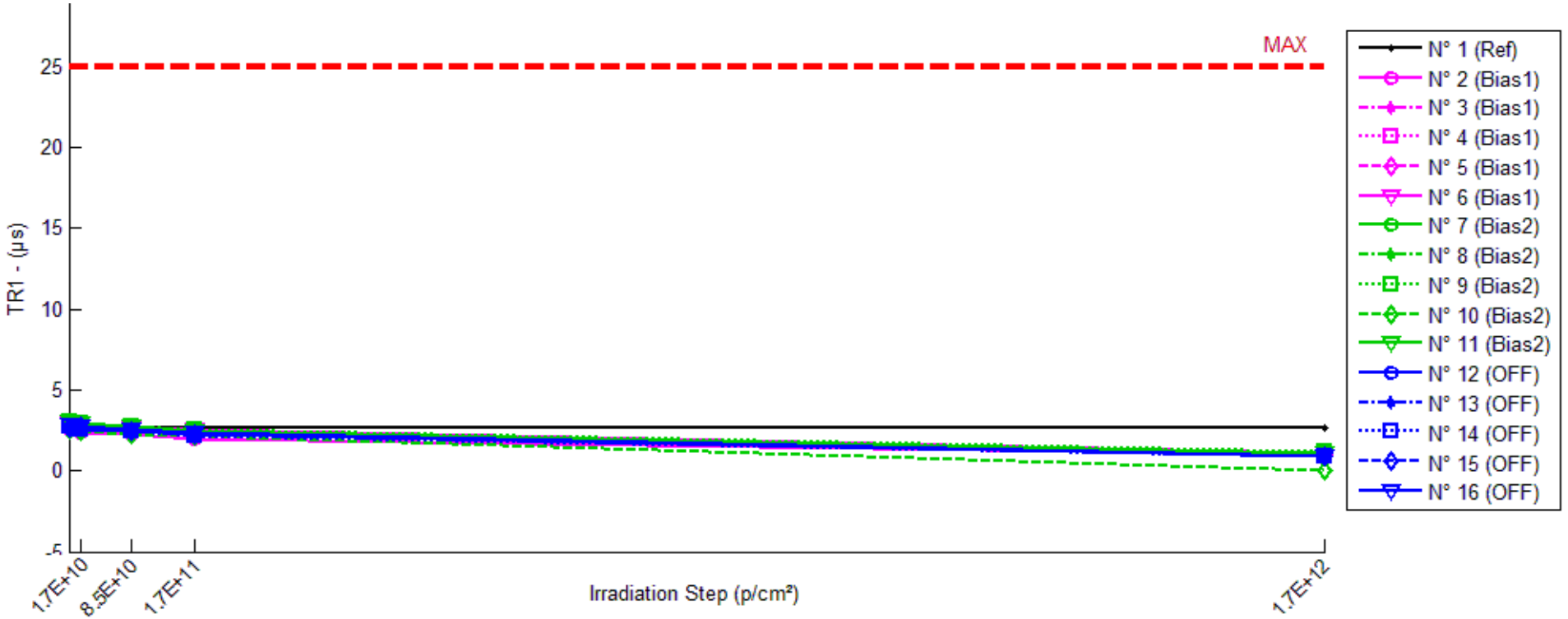
Delta [Ic(on)]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-1.007E-1	-3.162E-2	-5.311E-2	-4.907E-2
N° 2 (Bias1)	---	-3.051E-1	-1.203E+0	-1.702E+0	-3.660E+0
N° 3 (Bias1)	---	-3.700E-1	-1.223E+0	-1.976E+0	-4.590E+0
N° 4 (Bias1)	---	-2.610E-1	-9.327E-1	-1.501E+0	-3.459E+0
N° 5 (Bias1)	---	-3.253E-1	-1.160E+0	-1.893E+0	-4.617E+0
N° 6 (Bias1)	---	-3.819E-1	-1.375E+0	-2.213E+0	-5.342E+0
N° 7 (Bias2)	---	-3.827E-1	-1.319E+0	-2.108E+0	-4.854E+0
N° 8 (Bias2)	---	-4.279E-1	-1.529E+0	-2.433E+0	-5.604E+0
N° 9 (Bias2)	---	-3.389E-1	-1.183E+0	-1.868E+0	-4.169E+0
N° 10 (Bias2)	---	-2.742E-1	-1.008E+0	-1.573E+0	-3.312E+0
N° 11 (Bias2)	---	-3.668E-1	-1.291E+0	-2.047E+0	-4.528E+0
N° 12 (OFF)	---	-4.118E-1	-1.530E+0	-2.479E+0	-5.724E+0
N° 13 (OFF)	---	-3.764E-1	-1.403E+0	-2.313E+0	-5.093E+0
N° 14 (OFF)	---	-3.236E-1	-1.150E+0	-1.858E+0	-3.873E+0
N° 15 (OFF)	---	-3.531E-1	-1.229E+0	-1.979E+0	-4.157E+0
N° 16 (OFF)	---	-3.805E-1	-1.333E+0	-2.116E+0	-4.497E+0
Average (OFF)	---	-3.286E-1	-1.178E+0	-1.857E+0	-4.334E+0
σ (OFF)	---	4.920E-2	1.596E-1	2.705E-1	7.715E-1
Average+3σ (OFF)	---	-1.811E-1	-6.997E-1	-1.046E+0	-2.019E+0
Average-3σ (OFF)	---	-4.762E-1	-1.657E+0	-2.669E+0	-6.648E+0
Average (Bias1)	---	-3.581E-1	-1.266E+0	-2.006E+0	-4.493E+0
σ (Bias1)	---	5.690E-2	1.912E-1	3.166E-1	8.462E-1
Average+3σ (Bias1)	---	-1.874E-1	-6.926E-1	-1.056E+0	-1.955E+0
Average-3σ (Bias1)	---	-5.288E-1	-1.840E+0	-2.956E+0	-7.032E+0
Average (Bias2)	---	-3.691E-1	-1.329E+0	-2.149E+0	-4.669E+0
σ (Bias2)	---	3.294E-2	1.483E-1	2.499E-1	7.449E-1
Average+3σ (Bias2)	---	-2.703E-1	-8.842E-1	-1.399E+0	-2.434E+0
Average-3σ (Bias2)	---	-4.679E-1	-1.774E+0	-2.899E+0	-6.903E+0

30 MeV proton / detailed results

8. TR1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



30 MeV proton / detailed results

TR1 . (µs) **Max = 25.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	2.64	2.60	2.68	2.64	2.68
N° 2 (Bias1)	2.52	2.40	2.24	2.00	1.00
N° 3 (Bias1)	2.88	2.80	2.60	2.48	1.08
N° 4 (Bias1)	2.76	2.76	2.44	2.24	1.12
N° 5 (Bias1)	2.68	2.52	2.44	2.24	1.00
N° 6 (Bias1)	2.96	2.92	2.68	2.56	1.12
N° 7 (Bias2)	2.72	2.68	2.56	2.36	0.96
N° 8 (Bias2)	2.92	2.80	2.68	2.44	1.04
N° 9 (Bias2)	3.08	2.92	2.76	2.60	1.20
N° 10 (Bias2)	2.56	2.48	2.24	2.12	0.02
N° 11 (Bias2)	3.04	2.92	2.72	2.48	1.12
N° 12 (OFF)	2.68	2.60	2.48	2.28	0.88
N° 13 (OFF)	2.76	2.68	2.48	2.40	0.92
N° 14 (OFF)	2.72	2.60	2.44	2.20	0.92
N° 15 (OFF)	2.68	2.72	2.48	2.28	0.88
N° 16 (OFF)	2.88	2.76	2.52	2.32	0.92

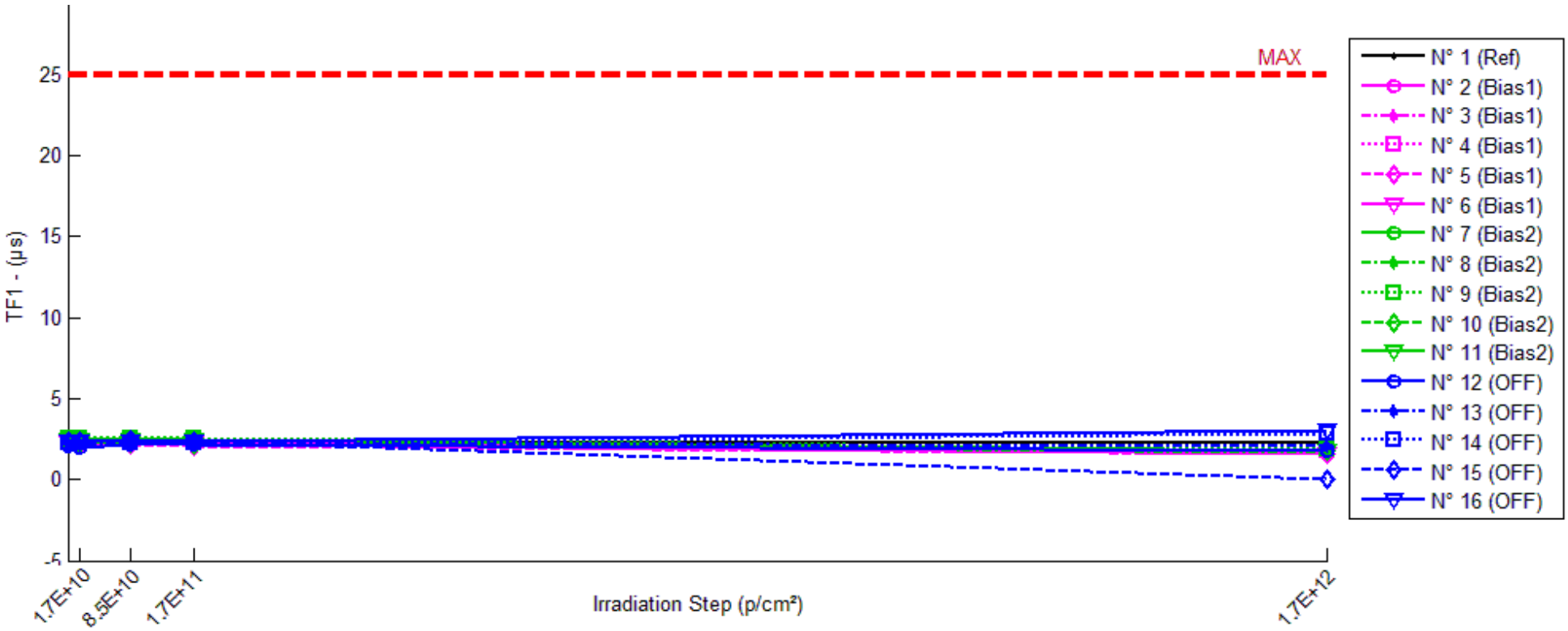
Delta [TR1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-4.000E-2	4.000E-2	0.000E+0	4.000E-2
N° 2 (Bias1)	---	-1.200E-1	-2.800E-1	-5.200E-1	-1.520E+0
N° 3 (Bias1)	---	-8.000E-2	-2.800E-1	-4.000E-1	-1.800E+0
N° 4 (Bias1)	---	0.000E+0	-3.200E-1	-5.200E-1	-1.640E+0
N° 5 (Bias1)	---	-1.600E-1	-2.400E-1	-4.400E-1	-1.680E+0
N° 6 (Bias1)	---	-4.000E-2	-2.800E-1	-4.000E-1	-1.840E+0
N° 7 (Bias2)	---	-4.000E-2	-1.600E-1	-3.600E-1	-1.760E+0
N° 8 (Bias2)	---	-1.200E-1	-2.400E-1	-4.800E-1	-1.880E+0
N° 9 (Bias2)	---	-1.600E-1	-3.200E-1	-4.800E-1	-1.880E+0
N° 10 (Bias2)	---	-8.000E-2	-3.200E-1	-4.400E-1	-2.540E+0
N° 11 (Bias2)	---	-1.200E-1	-3.200E-1	-5.600E-1	-1.920E+0
N° 12 (OFF)	---	-8.000E-2	-2.000E-1	-4.000E-1	-1.800E+0
N° 13 (OFF)	---	-8.000E-2	-2.800E-1	-3.600E-1	-1.840E+0
N° 14 (OFF)	---	-1.200E-1	-2.800E-1	-5.200E-1	-1.800E+0
N° 15 (OFF)	---	4.000E-2	-2.000E-1	-4.000E-1	-1.800E+0
N° 16 (OFF)	---	-1.200E-1	-3.600E-1	-5.600E-1	-1.960E+0
Average (OFF)	---	-8.000E-2	-2.800E-1	-4.560E-1	-1.696E+0
σ (OFF)	---	6.325E-2	2.828E-2	6.066E-2	1.284E-1
Average+3σ (OFF)	---	1.097E-1	-1.951E-1	-2.740E-1	-1.311E+0
Average-3σ (OFF)	---	-2.697E-1	-3.649E-1	-6.380E-1	-2.081E+0
Average (Bias1)	---	-1.040E-1	-2.720E-1	-4.640E-1	-1.996E+0
σ (Bias1)	---	4.561E-2	7.155E-2	7.266E-2	3.100E-1
Average+3σ (Bias1)	---	3.282E-2	-5.734E-2	-2.460E-1	-1.066E+0
Average-3σ (Bias1)	---	-2.408E-1	-4.867E-1	-6.820E-1	-2.926E+0
Average (Bias2)	---	-7.200E-2	-2.640E-1	-4.480E-1	-1.840E+0
σ (Bias2)	---	6.573E-2	6.693E-2	8.672E-2	6.928E-2
Average+3σ (Bias2)	---	1.252E-1	-6.320E-2	-1.878E-1	-1.632E+0
Average-3σ (Bias2)	---	-2.692E-1	-4.648E-1	-7.082E-1	-2.048E+0

30 MeV proton / detailed results

9. TF1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



30 MeV proton / detailed results

TF1 . (µs) **Max = 25.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	2.28	2.28	2.24	2.28	2.32
N° 2 (Bias1)	2.20	2.24	2.12	2.16	1.56
N° 3 (Bias1)	2.32	2.36	2.28	2.32	1.76
N° 4 (Bias1)	2.44	2.44	2.36	2.40	1.76
N° 5 (Bias1)	2.24	2.16	2.16	2.08	1.56
N° 6 (Bias1)	2.28	2.36	2.32	2.28	1.60
N° 7 (Bias2)	2.24	2.28	2.24	2.20	1.80
N° 8 (Bias2)	2.24	2.24	2.24	2.24	1.68
N° 9 (Bias2)	2.60	2.60	2.56	2.56	1.84
N° 10 (Bias2)	2.36	2.28	2.24	2.20	1.80
N° 11 (Bias2)	2.44	2.48	2.48	2.44	1.76
N° 12 (OFF)	2.04	2.00	2.12	2.12	1.80
N° 13 (OFF)	2.24	2.20	2.24	2.24	2.04
N° 14 (OFF)	2.28	2.28	2.28	2.28	2.84
N° 15 (OFF)	2.32	2.32	2.44	2.32	0.02
N° 16 (OFF)	2.40	2.32	2.36	2.36	3.00

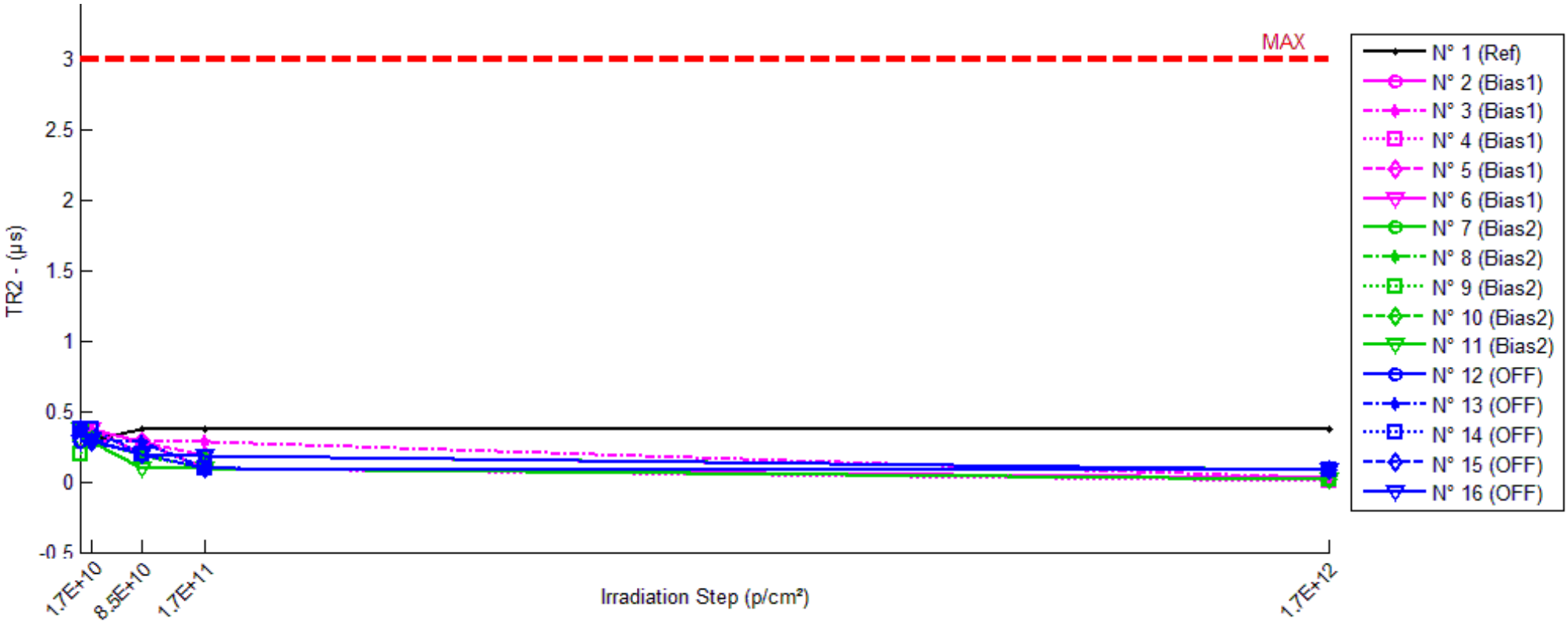
Delta [TF1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-4.000E-2	0.000E+0	4.000E-2
N° 2 (Bias1)	---	4.000E-2	-8.000E-2	-4.000E-2	-6.400E-1
N° 3 (Bias1)	---	4.000E-2	-4.000E-2	0.000E+0	-5.600E-1
N° 4 (Bias1)	---	0.000E+0	-8.000E-2	-4.000E-2	-6.800E-1
N° 5 (Bias1)	---	-8.000E-2	-8.000E-2	-1.600E-1	-6.800E-1
N° 6 (Bias1)	---	8.000E-2	4.000E-2	0.000E+0	-6.800E-1
N° 7 (Bias2)	---	4.000E-2	0.000E+0	-4.000E-2	-4.400E-1
N° 8 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	-5.600E-1
N° 9 (Bias2)	---	0.000E+0	-4.000E-2	-4.000E-2	-7.600E-1
N° 10 (Bias2)	---	-8.000E-2	-1.200E-1	-1.600E-1	-5.600E-1
N° 11 (Bias2)	---	4.000E-2	4.000E-2	0.000E+0	-6.800E-1
N° 12 (OFF)	---	-4.000E-2	8.000E-2	8.000E-2	-2.400E-1
N° 13 (OFF)	---	-4.000E-2	0.000E+0	0.000E+0	-2.000E-1
N° 14 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	5.600E-1
N° 15 (OFF)	---	0.000E+0	1.200E-1	0.000E+0	-2.300E+0
N° 16 (OFF)	---	-8.000E-2	-4.000E-2	-4.000E-2	6.000E-1
Average (OFF)	---	1.600E-2	-4.800E-2	-4.800E-2	-6.480E-1
σ (OFF)	---	6.066E-2	5.215E-2	6.573E-2	5.215E-2
Average+3σ (OFF)	---	1.980E-1	1.085E-1	1.492E-1	-4.915E-1
Average-3σ (OFF)	---	-1.660E-1	-2.045E-1	-2.452E-1	-8.045E-1
Average (Bias1)	---	-8.882E-17	-2.400E-2	-4.800E-2	-6.000E-1
σ (Bias1)	---	4.899E-2	6.066E-2	6.573E-2	1.233E-1
Average+3σ (Bias1)	---	1.470E-1	1.580E-1	1.492E-1	-2.301E-1
Average-3σ (Bias1)	---	-1.470E-1	-2.060E-1	-2.452E-1	-9.699E-1
Average (Bias2)	---	-3.200E-2	3.200E-2	8.000E-3	-3.160E-1
σ (Bias2)	---	3.347E-2	6.573E-2	4.382E-2	1.179E+0
Average+3σ (Bias2)	---	6.840E-2	2.292E-1	1.395E-1	3.222E+0
Average-3σ (Bias2)	---	-1.324E-1	-1.652E-1	-1.235E-1	-3.854E+0

30 MeV proton / detailed results

10.TR2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



30 MeV proton / detailed results

TR2 . (µs) **Max = 3.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.38	0.30	0.38	0.38	0.38
N° 2 (Bias1)	0.30	0.38	0.28	0.10	0.03
N° 3 (Bias1)	0.38	0.38	0.28	0.28	0.03
N° 4 (Bias1)	0.38	0.30	0.20	0.10	0.01
N° 5 (Bias1)	0.38	0.28	0.28	0.18	0.08
N° 6 (Bias1)	0.38	0.38	0.20	0.18	0.08
N° 7 (Bias2)	0.36	0.30	0.20	0.10	0.08
N° 8 (Bias2)	0.36	0.30	0.20	0.18	0.08
N° 9 (Bias2)	0.20	0.30	0.18	0.10	0.02
N° 10 (Bias2)	0.30	0.30	0.20	0.10	0.02
N° 11 (Bias2)	0.38	0.28	0.10	0.10	0.02
N° 12 (OFF)	0.28	0.30	0.20	0.18	0.08
N° 13 (OFF)	0.38	0.28	0.28	0.10	0.08
N° 14 (OFF)	0.38	0.38	0.20	0.10	0.08
N° 15 (OFF)	0.38	0.28	0.20	0.10	0.08
N° 16 (OFF)	0.28	0.30	0.20	0.18	0.08

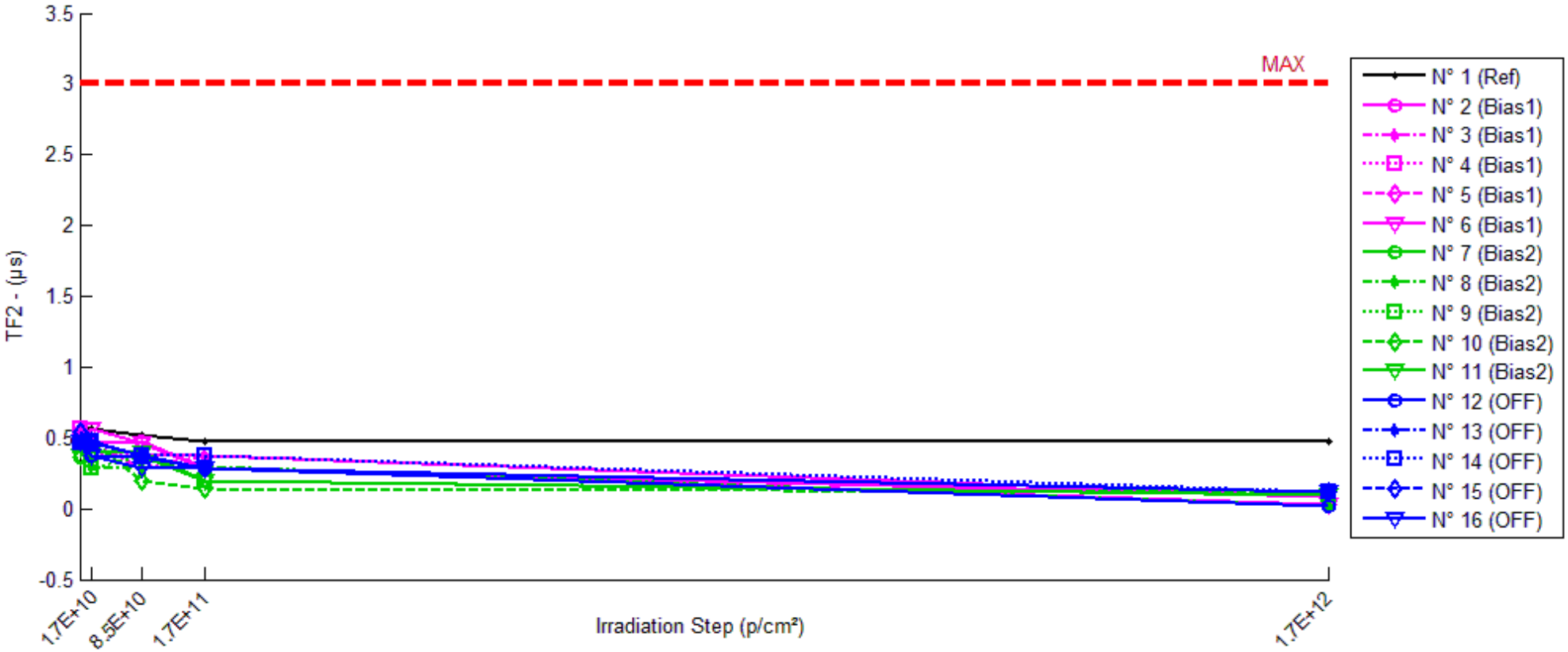
Delta [TR2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-8.000E-2	0.000E+0	0.000E+0	0.000E+0
N° 2 (Bias1)	---	8.000E-2	-2.000E-2	-2.000E-1	-2.700E-1
N° 3 (Bias1)	---	0.000E+0	-1.000E-1	-1.000E-1	-3.500E-1
N° 4 (Bias1)	---	-8.000E-2	-1.800E-1	-2.800E-1	-3.700E-1
N° 5 (Bias1)	---	-1.000E-1	-1.000E-1	-2.000E-1	-3.000E-1
N° 6 (Bias1)	---	0.000E+0	-1.800E-1	-2.000E-1	-3.000E-1
N° 7 (Bias2)	---	-6.000E-2	-1.600E-1	-2.600E-1	-2.800E-1
N° 8 (Bias2)	---	-6.000E-2	-1.600E-1	-1.800E-1	-2.800E-1
N° 9 (Bias2)	---	1.000E-1	-2.000E-2	-1.000E-1	-1.800E-1
N° 10 (Bias2)	---	0.000E+0	-1.000E-1	-2.000E-1	-2.800E-1
N° 11 (Bias2)	---	-1.000E-1	-2.800E-1	-2.800E-1	-3.600E-1
N° 12 (OFF)	---	2.000E-2	-8.000E-2	-1.000E-1	-2.000E-1
N° 13 (OFF)	---	-1.000E-1	-1.000E-1	-2.800E-1	-3.000E-1
N° 14 (OFF)	---	0.000E+0	-1.800E-1	-2.800E-1	-3.000E-1
N° 15 (OFF)	---	-1.000E-1	-1.800E-1	-2.800E-1	-3.000E-1
N° 16 (OFF)	---	2.000E-2	-8.000E-2	-1.000E-1	-2.000E-1
Average (OFF)	---	-2.000E-2	-1.160E-1	-1.960E-1	-3.180E-1
σ (OFF)	---	7.211E-2	6.693E-2	6.387E-2	4.087E-2
Average+3σ (OFF)	---	1.963E-1	8.480E-2	-4.375E-3	-1.954E-1
Average-3σ (OFF)	---	-2.363E-1	-3.168E-1	-3.876E-1	-4.406E-1
Average (Bias1)	---	-2.400E-2	-1.440E-1	-2.040E-1	-2.760E-1
σ (Bias1)	---	7.797E-2	9.529E-2	7.127E-2	6.387E-2
Average+3σ (Bias1)	---	2.099E-1	1.419E-1	9.822E-3	-8.438E-2
Average-3σ (Bias1)	---	-2.579E-1	-4.299E-1	-4.178E-1	-4.676E-1
Average (Bias2)	---	-3.200E-2	-1.240E-1	-2.080E-1	-2.600E-1
σ (Bias2)	---	6.261E-2	5.177E-2	9.859E-2	5.477E-2
Average+3σ (Bias2)	---	1.558E-1	3.131E-2	8.777E-2	-9.568E-2
Average-3σ (Bias2)	---	-2.198E-1	-2.793E-1	-5.038E-1	-4.243E-1

30 MeV proton / detailed results

11.TF2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



30 MeV proton / detailed results

TF2 . (µs) **Max = 3.0**

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	0.56	0.56	0.52	0.48	0.48
N° 2 (Bias1)	0.48	0.46	0.48	0.28	0.09
N° 3 (Bias1)	0.56	0.46	0.28	0.38	0.09
N° 4 (Bias1)	0.56	0.38	0.38	0.38	0.09
N° 5 (Bias1)	0.46	0.46	0.38	0.28	0.03
N° 6 (Bias1)	0.48	0.56	0.46	0.28	0.03
N° 7 (Bias2)	0.36	0.48	0.38	0.20	0.10
N° 8 (Bias2)	0.46	0.30	0.28	0.30	0.02
N° 9 (Bias2)	0.46	0.28	0.38	0.20	0.10
N° 10 (Bias2)	0.46	0.48	0.20	0.14	0.12
N° 11 (Bias2)	0.38	0.40	0.40	0.20	0.10
N° 12 (OFF)	0.46	0.38	0.36	0.28	0.02
N° 13 (OFF)	0.46	0.46	0.38	0.28	0.12
N° 14 (OFF)	0.46	0.48	0.38	0.38	0.12
N° 15 (OFF)	0.54	0.48	0.38	0.28	0.12
N° 16 (OFF)	0.48	0.38	0.28	0.28	0.12

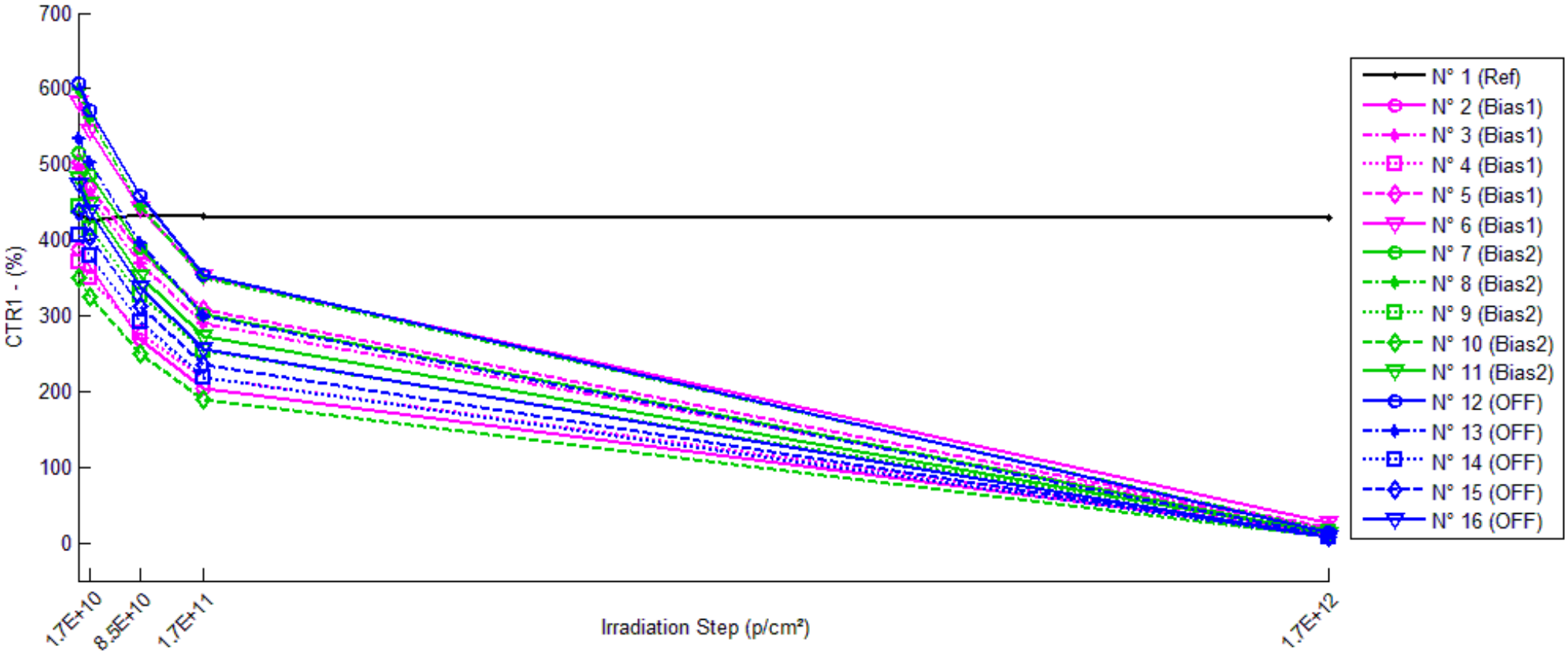
Delta [TF2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-4.000E-2	-8.000E-2	-8.000E-2
N° 2 (Bias1)	---	-2.000E-2	0.000E+0	-2.000E-1	-3.900E-1
N° 3 (Bias1)	---	-1.000E-1	-2.800E-1	-1.800E-1	-4.700E-1
N° 4 (Bias1)	---	-1.800E-1	-1.800E-1	-1.800E-1	-4.700E-1
N° 5 (Bias1)	---	0.000E+0	-8.000E-2	-1.800E-1	-4.300E-1
N° 6 (Bias1)	---	8.000E-2	-2.000E-2	-2.000E-1	-4.500E-1
N° 7 (Bias2)	---	1.200E-1	2.000E-2	-1.600E-1	-2.600E-1
N° 8 (Bias2)	---	-1.600E-1	-1.800E-1	-1.600E-1	-4.400E-1
N° 9 (Bias2)	---	-1.800E-1	-8.000E-2	-2.600E-1	-3.600E-1
N° 10 (Bias2)	---	2.000E-2	-2.600E-1	-3.200E-1	-3.400E-1
N° 11 (Bias2)	---	2.000E-2	2.000E-2	-1.800E-1	-2.800E-1
N° 12 (OFF)	---	-8.000E-2	-1.000E-1	-1.800E-1	-4.400E-1
N° 13 (OFF)	---	0.000E+0	-8.000E-2	-1.800E-1	-3.400E-1
N° 14 (OFF)	---	2.000E-2	-8.000E-2	-8.000E-2	-3.400E-1
N° 15 (OFF)	---	-6.000E-2	-1.600E-1	-2.600E-1	-4.200E-1
N° 16 (OFF)	---	-1.000E-1	-2.000E-1	-2.000E-1	-3.600E-1
Average (OFF)	---	-4.400E-2	-1.120E-1	-1.880E-1	-4.420E-1
σ (OFF)	---	9.940E-2	1.171E-1	1.095E-2	3.347E-2
Average+3σ (OFF)	---	2.542E-1	2.394E-1	-1.551E-1	-3.416E-1
Average-3σ (OFF)	---	-3.422E-1	-4.634E-1	-2.209E-1	-5.424E-1
Average (Bias1)	---	-3.600E-2	-9.600E-2	-2.160E-1	-3.360E-1
σ (Bias1)	---	1.292E-1	1.236E-1	7.127E-2	7.127E-2
Average+3σ (Bias1)	---	3.515E-1	2.748E-1	-2.178E-3	-1.222E-1
Average-3σ (Bias1)	---	-4.235E-1	-4.668E-1	-4.298E-1	-5.498E-1
Average (Bias2)	---	-4.400E-2	-1.240E-1	-1.800E-1	-3.800E-1
σ (Bias2)	---	5.177E-2	5.367E-2	6.481E-2	4.690E-2
Average+3σ (Bias2)	---	1.113E-1	3.700E-2	1.442E-2	-2.393E-1
Average-3σ (Bias2)	---	-1.993E-1	-2.850E-1	-3.744E-1	-5.207E-1

30 MeV proton / detailed results

12.CTR1

Ta=25°C; Vce=5V; If=1mA



30 MeV proton / detailed results

CTR1 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	434.693	424.967	434.406	430.605	428.572
N° 2 (Bias1)	388.526	364.923	268.898	204.285	10.806
N° 3 (Bias1)	495.127	457.268	368.904	289.637	17.736
N° 4 (Bias1)	371.018	350.162	277.497	218.068	14.618
N° 5 (Bias1)	502.303	468.276	382.625	307.471	20.946
N° 6 (Bias1)	581.806	544.450	441.136	352.405	26.643
N° 7 (Bias2)	515.214	484.907	389.505	303.020	12.566
N° 8 (Bias2)	597.939	560.556	444.357	349.417	16.848
N° 9 (Bias2)	445.052	414.487	327.495	254.893	13.474
N° 10 (Bias2)	349.268	325.337	249.193	189.911	7.792
N° 11 (Bias2)	481.120	447.876	351.706	272.719	12.414
N° 12 (OFF)	606.578	571.837	459.486	354.983	13.789
N° 13 (OFF)	533.729	503.256	395.580	300.578	9.502
N° 14 (OFF)	406.880	378.864	291.875	218.675	8.055
N° 15 (OFF)	436.961	404.526	312.739	234.272	7.425
N° 16 (OFF)	473.910	437.715	337.996	256.535	8.427

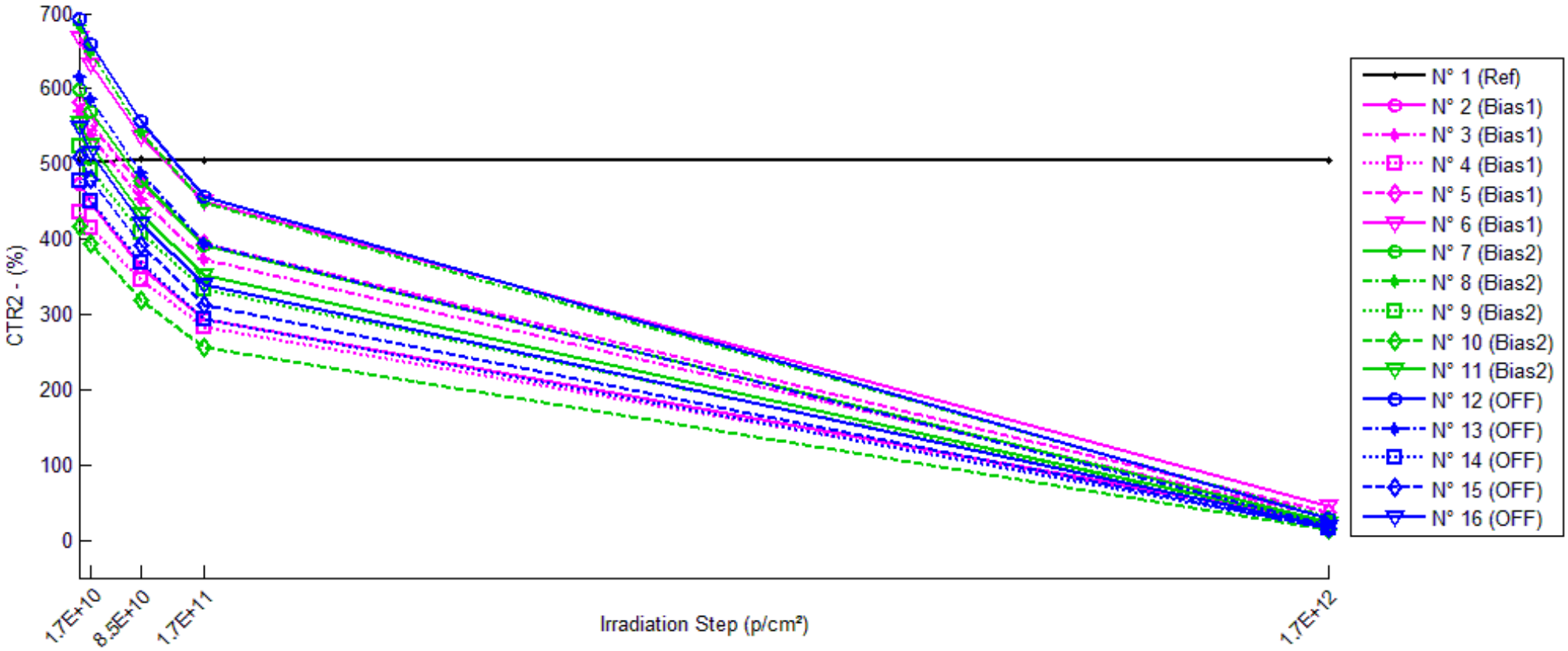
1/Delta [CTR1]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	5.265E-5	1.519E-6	2.184E-5	3.286E-5
N° 2 (Bias1)	---	1.665E-4	1.145E-3	2.321E-3	8.997E-2
N° 3 (Bias1)	---	1.672E-4	6.910E-4	1.433E-3	5.436E-2
N° 4 (Bias1)	---	1.605E-4	9.083E-4	1.890E-3	6.571E-2
N° 5 (Bias1)	---	1.447E-4	6.227E-4	1.262E-3	4.575E-2
N° 6 (Bias1)	---	1.179E-4	5.481E-4	1.119E-3	3.581E-2
N° 7 (Bias2)	---	1.213E-4	6.264E-4	1.359E-3	7.764E-2
N° 8 (Bias2)	---	1.115E-4	5.780E-4	1.189E-3	5.768E-2
N° 9 (Bias2)	---	1.657E-4	8.066E-4	1.676E-3	7.197E-2
N° 10 (Bias2)	---	2.106E-4	1.150E-3	2.402E-3	1.255E-1
N° 11 (Bias2)	---	1.543E-4	7.648E-4	1.588E-3	7.847E-2
N° 12 (OFF)	---	1.002E-4	5.278E-4	1.168E-3	7.087E-2
N° 13 (OFF)	---	1.134E-4	6.543E-4	1.453E-3	1.034E-1
N° 14 (OFF)	---	1.817E-4	9.684E-4	2.115E-3	1.217E-1
N° 15 (OFF)	---	1.835E-4	9.090E-4	1.980E-3	1.324E-1
N° 16 (OFF)	---	1.745E-4	8.485E-4	1.788E-3	1.166E-1
Average (OFF)	---	1.514E-4	7.830E-4	1.605E-3	5.832E-2
σ (OFF)	---	2.077E-5	2.430E-4	4.946E-4	2.083E-2
Average+3σ (OFF)	---	2.137E-4	1.512E-3	3.089E-3	1.208E-1
Average-3σ (OFF)	---	8.904E-5	5.415E-5	1.212E-4	-4.181E-3
Average (Bias1)	---	1.527E-4	7.851E-4	1.643E-3	8.225E-2
σ (Bias1)	---	3.938E-5	2.247E-4	4.656E-4	2.556E-2
Average+3σ (Bias1)	---	2.708E-4	1.459E-3	3.040E-3	1.589E-1
Average-3σ (Bias1)	---	3.453E-5	1.110E-4	2.463E-4	5.571E-3
Average (Bias2)	---	1.507E-4	7.816E-4	1.701E-3	1.090E-1
σ (Bias2)	---	4.046E-5	1.846E-4	3.879E-4	2.372E-2
Average+3σ (Bias2)	---	2.720E-4	1.335E-3	2.865E-3	1.801E-1
Average-3σ (Bias2)	---	2.929E-5	2.279E-4	5.372E-4	3.781E-2

30 MeV proton / detailed results

13.CTR2

Ta=25°C; Vce=5V; If=2mA



30 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	507.520	502.063	507.627	505.252	504.113
N° 2 (Bias1)	472.306	447.785	361.986	293.547	23.390
N° 3 (Bias1)	569.318	537.199	452.632	373.743	30.482
N° 4 (Bias1)	435.126	414.740	345.036	284.151	24.526
N° 5 (Bias1)	582.117	553.626	471.107	394.075	35.796
N° 6 (Bias1)	666.878	632.984	536.745	449.350	44.746
N° 7 (Bias2)	598.210	568.739	477.653	391.671	23.737
N° 8 (Bias2)	684.047	649.249	542.754	447.826	30.564
N° 9 (Bias2)	522.598	493.156	408.495	333.167	23.654
N° 10 (Bias2)	417.268	393.602	318.936	255.538	14.239
N° 11 (Bias2)	555.172	524.802	433.605	353.093	22.211
N° 12 (OFF)	692.269	659.966	557.717	457.200	28.973
N° 13 (OFF)	615.611	586.355	487.288	394.129	20.186
N° 14 (OFF)	477.222	450.336	368.023	293.042	15.527
N° 15 (OFF)	509.053	479.234	392.688	313.463	15.216
N° 16 (OFF)	547.582	515.351	422.052	339.937	17.383

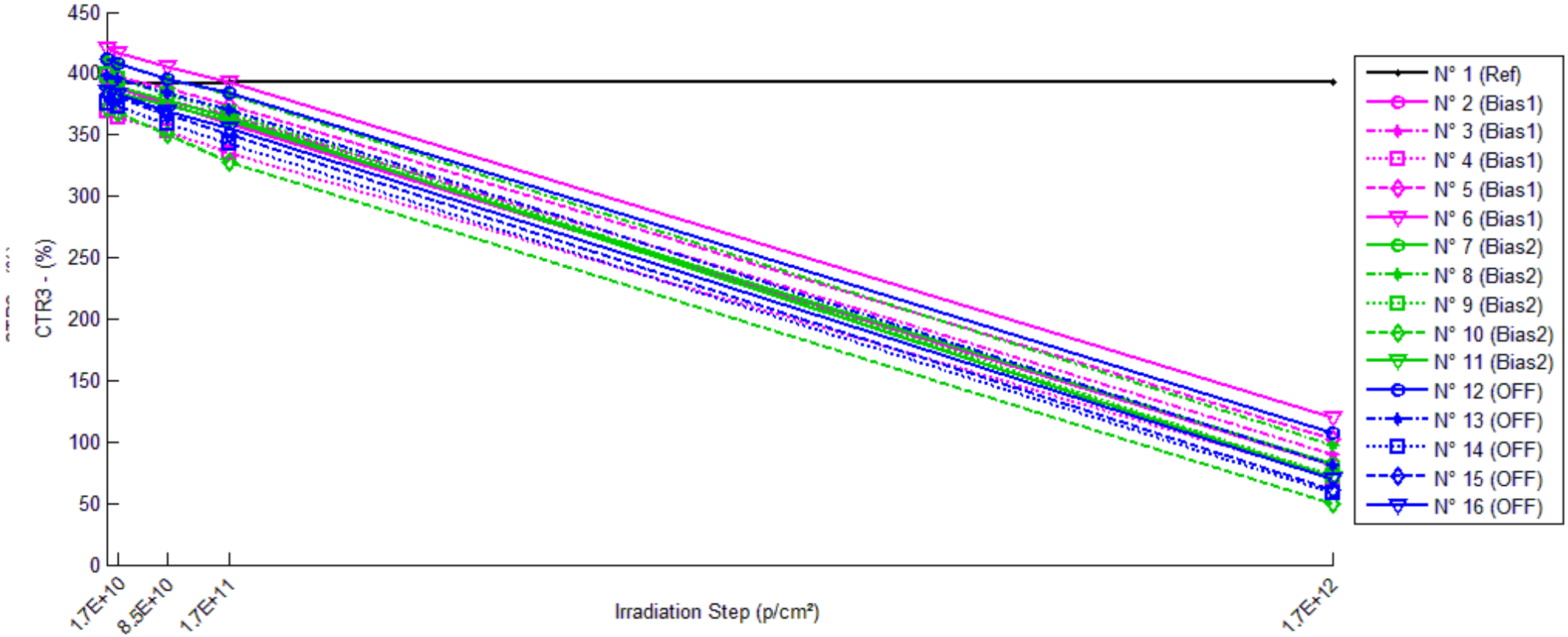
1/Delta [CTR2]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.141E-5	-4.134E-7	8.845E-6	1.331E-5
N° 2 (Bias1)	---	1.159E-4	6.453E-4	1.289E-3	4.064E-2
N° 3 (Bias1)	---	1.050E-4	4.528E-4	9.191E-4	3.105E-2
N° 4 (Bias1)	---	1.130E-4	6.001E-4	1.221E-3	3.847E-2
N° 5 (Bias1)	---	8.841E-5	4.048E-4	8.197E-4	2.622E-2
N° 6 (Bias1)	---	8.029E-5	3.636E-4	7.259E-4	2.085E-2
N° 7 (Bias2)	---	8.662E-5	4.219E-4	8.815E-4	4.046E-2
N° 8 (Bias2)	---	7.835E-5	3.806E-4	7.711E-4	3.126E-2
N° 9 (Bias2)	---	1.142E-4	5.345E-4	1.088E-3	4.036E-2
N° 10 (Bias2)	---	1.441E-4	7.389E-4	1.517E-3	6.783E-2
N° 11 (Bias2)	---	1.042E-4	5.050E-4	1.031E-3	4.322E-2
N° 12 (OFF)	---	7.070E-5	3.485E-4	7.427E-4	3.307E-2
N° 13 (OFF)	---	8.105E-5	4.278E-4	9.128E-4	4.792E-2
N° 14 (OFF)	---	1.251E-4	6.218E-4	1.317E-3	6.231E-2
N° 15 (OFF)	---	1.222E-4	5.821E-4	1.226E-3	6.376E-2
N° 16 (OFF)	---	1.142E-4	5.432E-4	1.116E-3	5.570E-2
Average (OFF)	---	1.005E-4	4.933E-4	9.950E-4	3.145E-2
σ (OFF)	---	1.556E-5	1.233E-4	2.483E-4	8.271E-3
Average+3σ (OFF)	---	1.472E-4	8.632E-4	1.740E-3	5.626E-2
Average-3σ (OFF)	---	5.384E-5	1.234E-4	2.501E-4	6.632E-3
Average (Bias1)	---	1.055E-4	5.162E-4	1.058E-3	4.463E-2
σ (Bias1)	---	2.579E-5	1.390E-4	2.853E-4	1.374E-2
Average+3σ (Bias1)	---	1.829E-4	9.333E-4	1.914E-3	8.584E-2
Average-3σ (Bias1)	---	2.813E-5	9.903E-5	2.018E-4	3.413E-3
Average (Bias2)	---	1.027E-4	5.047E-4	1.063E-3	5.255E-2
σ (Bias2)	---	2.504E-5	1.135E-4	2.339E-4	1.257E-2
Average+3σ (Bias2)	---	1.778E-4	8.450E-4	1.765E-3	9.025E-2
Average-3σ (Bias2)	---	2.753E-5	1.643E-4	3.609E-4	1.485E-2

30 MeV proton / detailed results

14.CTR3

Ta=25°C; Vce=5V; If=10mA



30 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	393.812	393.423	391.863	392.857	392.761
N° 2 (Bias1)	392.433	388.530	375.325	359.316	80.923
N° 3 (Bias1)	392.972	388.497	378.306	365.203	90.231
N° 4 (Bias1)	369.006	364.632	352.591	335.766	70.374
N° 5 (Bias1)	401.375	396.972	387.539	373.987	102.154
N° 6 (Bias1)	420.497	416.308	405.226	393.349	119.571
N° 7 (Bias2)	389.684	384.510	374.262	361.072	82.258
N° 8 (Bias2)	412.008	408.186	395.049	382.885	96.736
N° 9 (Bias2)	399.616	395.703	382.721	367.444	71.964
N° 10 (Bias2)	372.008	367.403	350.608	328.079	49.072
N° 11 (Bias2)	394.126	389.831	377.833	363.900	71.268
N° 12 (OFF)	411.146	408.524	395.219	384.660	107.044
N° 13 (OFF)	398.123	395.988	384.196	370.349	81.077
N° 14 (OFF)	375.814	373.160	359.153	342.607	57.998
N° 15 (OFF)	383.530	380.210	366.308	350.964	61.017
N° 16 (OFF)	385.663	383.081	369.354	355.836	68.991

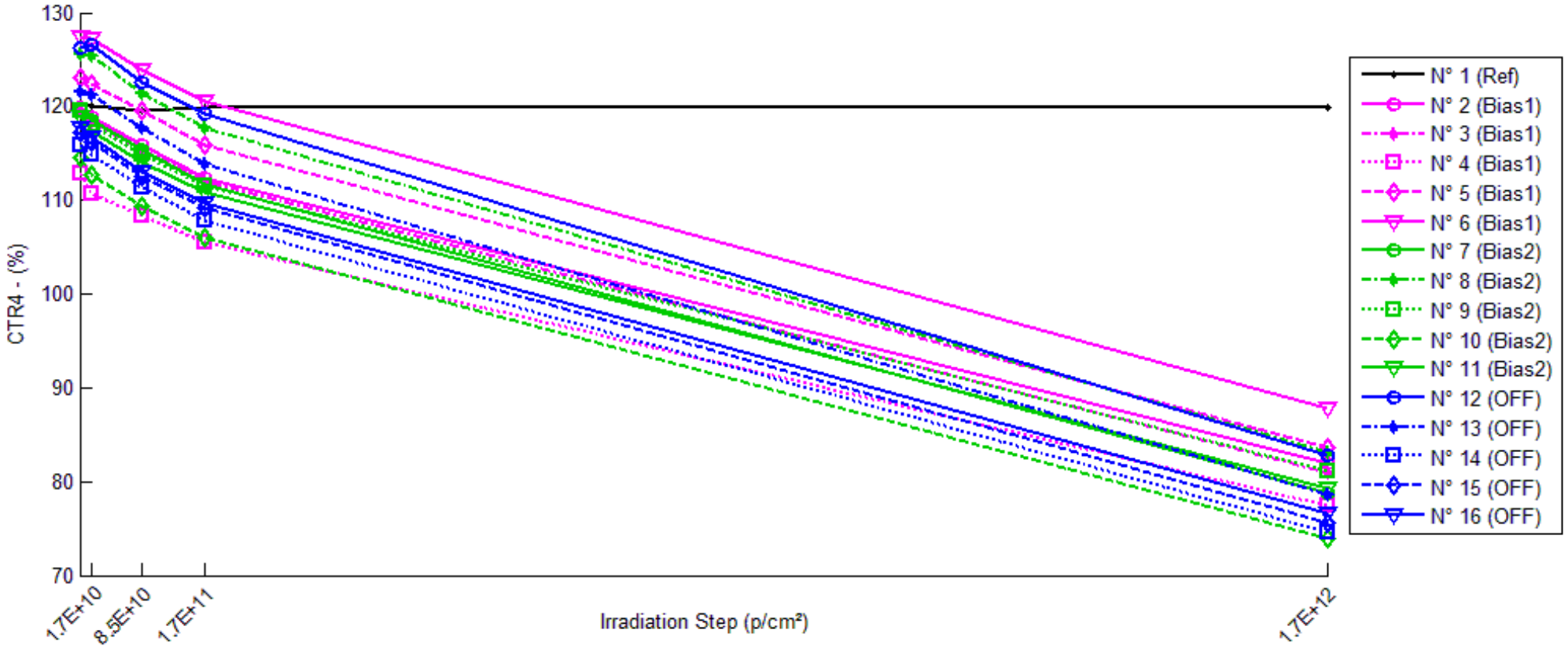
1/Delta [CTR3]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.511E-6	1.264E-5	6.175E-6	6.796E-6
N° 2 (Bias1)	---	2.559E-5	1.161E-4	2.349E-4	9.809E-3
N° 3 (Bias1)	---	2.932E-5	9.865E-5	1.935E-4	8.538E-3
N° 4 (Bias1)	---	3.251E-5	1.262E-4	2.683E-4	1.150E-2
N° 5 (Bias1)	---	2.763E-5	8.895E-5	1.825E-4	7.298E-3
N° 6 (Bias1)	---	2.393E-5	8.962E-5	1.641E-4	5.985E-3
N° 7 (Bias2)	---	3.453E-5	1.057E-4	2.033E-4	9.591E-3
N° 8 (Bias2)	---	2.272E-5	1.042E-4	1.846E-4	7.910E-3
N° 9 (Bias2)	---	2.475E-5	1.105E-4	2.191E-4	1.139E-2
N° 10 (Bias2)	---	3.369E-5	1.641E-4	3.599E-4	1.769E-2
N° 11 (Bias2)	---	2.796E-5	1.094E-4	2.108E-4	1.149E-2
N° 12 (OFF)	---	1.561E-5	9.802E-5	1.675E-4	6.910E-3
N° 13 (OFF)	---	1.354E-5	9.105E-5	1.884E-4	9.822E-3
N° 14 (OFF)	---	1.892E-5	1.234E-4	2.579E-4	1.458E-2
N° 15 (OFF)	---	2.277E-5	1.226E-4	2.419E-4	1.378E-2
N° 16 (OFF)	---	1.747E-5	1.145E-4	2.173E-4	1.190E-2
Average (OFF)	---	2.780E-5	1.039E-4	2.086E-4	8.626E-3
σ (OFF)	---	3.331E-6	1.659E-5	4.225E-5	2.145E-3
Average+3σ (OFF)	---	3.779E-5	1.537E-4	3.354E-4	1.506E-2
Average-3σ (OFF)	---	1.780E-5	5.414E-5	8.189E-5	2.191E-3
Average (Bias1)	---	2.873E-5	1.188E-4	2.355E-4	1.162E-2
σ (Bias1)	---	5.264E-6	2.545E-5	7.069E-5	3.701E-3
Average+3σ (Bias1)	---	4.452E-5	1.951E-4	4.476E-4	2.272E-2
Average-3σ (Bias1)	---	1.294E-5	4.242E-5	2.348E-5	5.122E-4
Average (Bias2)	---	1.766E-5	1.099E-4	2.146E-4	1.140E-2
σ (Bias2)	---	3.495E-6	1.468E-5	3.721E-5	3.110E-3
Average+3σ (Bias2)	---	2.815E-5	1.540E-4	3.262E-4	2.073E-2
Average-3σ (Bias2)	---	7.177E-6	6.588E-5	1.030E-4	2.069E-3

30 MeV proton / detailed results

15.CTR4

Ta=25°C; Vce=5V; If=50mA



30 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	120.080	120.019	119.606	119.853	119.850
N° 2 (Bias1)	119.939	118.864	115.799	112.414	81.872
N° 3 (Bias1)	119.581	118.422	115.420	112.057	81.006
N° 4 (Bias1)	112.892	110.773	108.339	105.498	77.358
N° 5 (Bias1)	122.985	122.401	119.484	115.835	83.617
N° 6 (Bias1)	127.462	127.214	123.930	120.478	87.738
N° 7 (Bias2)	119.637	118.634	115.352	111.712	78.775
N° 8 (Bias2)	125.549	125.392	121.462	117.697	83.053
N° 9 (Bias2)	119.573	118.044	114.798	111.570	81.089
N° 10 (Bias2)	114.586	112.772	109.358	105.981	74.006
N° 11 (Bias2)	118.900	117.393	114.096	110.807	79.261
N° 12 (OFF)	126.232	126.603	122.563	119.182	82.704
N° 13 (OFF)	121.577	121.266	117.660	113.847	78.650
N° 14 (OFF)	115.832	114.848	111.360	107.830	74.524
N° 15 (OFF)	117.296	116.156	112.568	109.137	75.528
N° 16 (OFF)	117.772	116.755	113.017	109.751	76.622

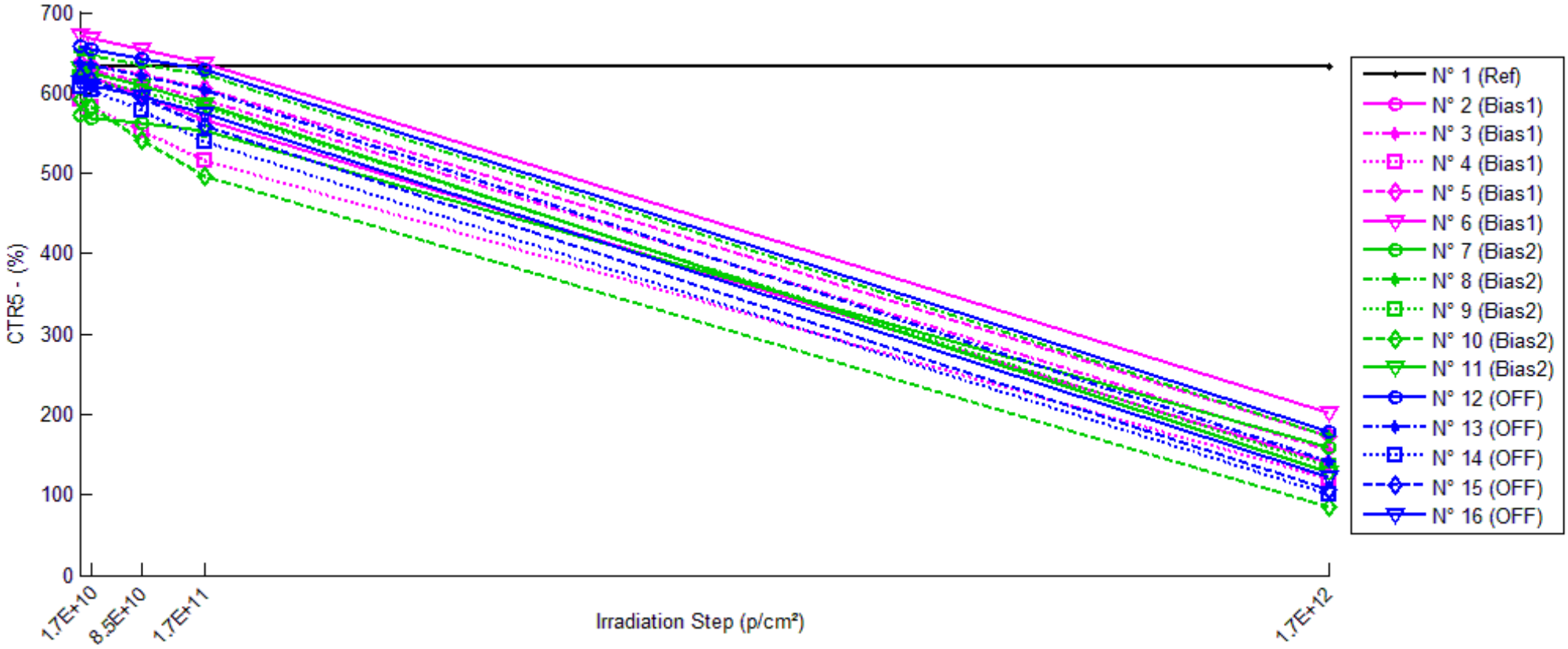
1/Delta [CTR4]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	4.219E-6	3.298E-5	1.579E-5	1.600E-5
N° 2 (Bias1)	---	7.538E-5	2.981E-4	5.581E-4	3.877E-3
N° 3 (Bias1)	---	8.187E-5	3.015E-4	5.615E-4	3.982E-3
N° 4 (Bias1)	---	1.694E-4	3.723E-4	6.208E-4	4.069E-3
N° 5 (Bias1)	---	3.881E-5	2.383E-4	5.019E-4	3.828E-3
N° 6 (Bias1)	---	1.526E-5	2.236E-4	4.548E-4	3.552E-3
N° 7 (Bias2)	---	7.070E-5	3.105E-4	5.930E-4	4.336E-3
N° 8 (Bias2)	---	1.002E-5	2.681E-4	5.314E-4	4.076E-3
N° 9 (Bias2)	---	1.083E-4	3.479E-4	5.999E-4	3.969E-3
N° 10 (Bias2)	---	1.403E-4	4.172E-4	7.085E-4	4.785E-3
N° 11 (Bias2)	---	1.080E-4	3.541E-4	6.143E-4	4.206E-3
N° 12 (OFF)	---	-2.321E-5	2.371E-4	4.686E-4	4.169E-3
N° 13 (OFF)	---	2.110E-5	2.738E-4	5.585E-4	4.489E-3
N° 14 (OFF)	---	7.396E-5	3.467E-4	6.406E-4	4.785E-3
N° 15 (OFF)	---	8.361E-5	3.581E-4	6.373E-4	4.715E-3
N° 16 (OFF)	---	7.396E-5	3.572E-4	6.205E-4	4.560E-3
Average (OFF)	---	7.615E-5	2.867E-4	5.394E-4	3.862E-3
σ (OFF)	---	5.881E-5	5.916E-5	6.331E-5	1.966E-4
Average+3σ (OFF)	---	2.526E-4	4.642E-4	7.294E-4	4.452E-3
Average-3σ (OFF)	---	-1.003E-4	1.092E-4	3.495E-4	3.272E-3
Average (Bias1)	---	8.746E-5	3.396E-4	6.094E-4	4.274E-3
σ (Bias1)	---	4.982E-5	5.538E-5	6.381E-5	3.171E-4
Average+3σ (Bias1)	---	2.369E-4	5.057E-4	8.009E-4	5.226E-3
Average-3σ (Bias1)	---	-6.200E-5	1.734E-4	4.180E-4	3.323E-3
Average (Bias2)	---	4.588E-5	3.146E-4	5.851E-4	4.544E-3
σ (Bias2)	---	4.579E-5	5.568E-5	7.305E-5	2.403E-4
Average+3σ (Bias2)	---	1.833E-4	4.816E-4	8.043E-4	5.265E-3
Average-3σ (Bias2)	---	-9.149E-5	1.476E-4	3.659E-4	3.823E-3

30 MeV proton / detailed results

16.CTR5

Ta=25°C; Vce=30V; If=10mA



30 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	634.093	633.219	631.939	633.009	632.764
N° 2 (Bias1)	624.527	619.564	598.306	566.474	138.458
N° 3 (Bias1)	632.819	627.921	613.864	592.538	154.575
N° 4 (Bias1)	591.151	582.878	553.231	516.451	119.226
N° 5 (Bias1)	637.895	633.805	622.838	606.003	173.394
N° 6 (Bias1)	672.632	668.173	654.420	636.955	202.079
N° 7 (Bias2)	573.119	569.032	562.248	553.447	158.876
N° 8 (Bias2)	650.567	646.723	635.117	622.061	172.326
N° 9 (Bias2)	619.333	615.260	601.790	582.038	135.285
N° 10 (Bias2)	591.455	581.105	541.684	495.547	85.744
N° 11 (Bias2)	630.477	625.440	609.334	585.330	128.561
N° 12 (OFF)	657.974	655.146	641.697	628.446	179.322
N° 13 (OFF)	637.233	634.978	621.928	604.236	140.911
N° 14 (OFF)	608.038	603.210	577.909	539.512	100.257
N° 15 (OFF)	620.586	615.691	593.708	559.572	106.743
N° 16 (OFF)	613.635	609.933	595.538	574.646	122.111

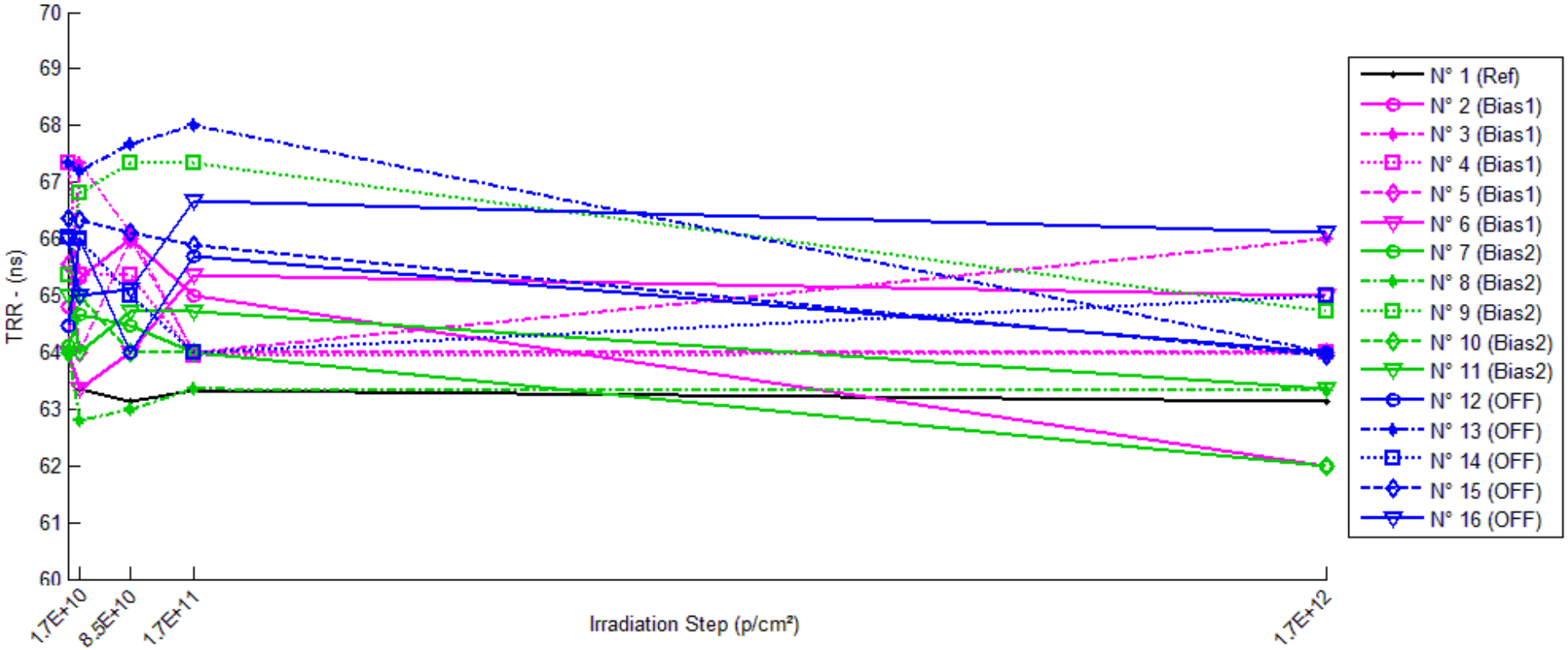
1/Delta [CTR5]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	2.178E-6	5.377E-6	2.702E-6	3.312E-6
N° 2 (Bias1)	---	1.283E-5	7.017E-5	1.641E-4	5.621E-3
N° 3 (Bias1)	---	1.233E-5	4.879E-5	1.074E-4	4.889E-3
N° 4 (Bias1)	---	2.401E-5	1.159E-4	2.447E-4	6.696E-3
N° 5 (Bias1)	---	1.012E-5	3.790E-5	8.250E-5	4.200E-3
N° 6 (Bias1)	---	9.921E-6	4.137E-5	8.327E-5	3.462E-3
N° 7 (Bias2)	---	1.253E-5	3.374E-5	6.202E-5	4.549E-3
N° 8 (Bias2)	---	9.135E-6	3.739E-5	7.044E-5	4.266E-3
N° 9 (Bias2)	---	1.069E-5	4.707E-5	1.035E-4	5.777E-3
N° 10 (Bias2)	---	3.011E-5	1.554E-4	3.272E-4	9.972E-3
N° 11 (Bias2)	---	1.277E-5	5.504E-5	1.223E-4	6.192E-3
N° 12 (OFF)	---	6.562E-6	3.855E-5	7.141E-5	4.057E-3
N° 13 (OFF)	---	5.573E-6	3.862E-5	8.570E-5	5.527E-3
N° 14 (OFF)	---	1.316E-5	8.574E-5	2.089E-4	8.330E-3
N° 15 (OFF)	---	1.281E-5	7.295E-5	1.757E-4	7.757E-3
N° 16 (OFF)	---	9.893E-6	4.952E-5	1.106E-4	6.560E-3
Average (OFF)	---	1.384E-5	6.284E-5	1.364E-4	4.974E-3
σ (OFF)	---	5.830E-6	3.223E-5	6.902E-5	1.253E-3
Average+3σ (OFF)	---	3.133E-5	1.595E-4	3.435E-4	8.732E-3
Average-3σ (OFF)	---	-3.650E-6	-3.384E-5	-7.068E-5	1.215E-3
Average (Bias1)	---	1.505E-5	6.572E-5	1.371E-4	6.151E-3
σ (Bias1)	---	8.550E-6	5.080E-5	1.091E-4	2.284E-3
Average+3σ (Bias1)	---	4.070E-5	2.181E-4	4.643E-4	1.300E-2
Average-3σ (Bias1)	---	-1.060E-5	-8.667E-5	-1.901E-4	-6.995E-4
Average (Bias2)	---	9.600E-6	5.708E-5	1.305E-4	6.446E-3
σ (Bias2)	---	3.483E-6	2.130E-5	5.934E-5	1.720E-3
Average+3σ (Bias2)	---	2.005E-5	1.210E-4	3.085E-4	1.161E-2
Average-3σ (Bias2)	---	-8.499E-7	-6.821E-6	-4.756E-5	1.286E-3

30 MeV proton / detailed results

17.TRR

Ta=25°C; If = 5mA; RL = 100 Ohms; Irec = 10% Irm



30 MeV proton / detailed results

TRR . (ns)

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	64.00	63.37	63.12	63.33	63.12
N° 2 (Bias1)	64.81	65.31	66.00	65.00	62.00
N° 3 (Bias1)	64.00	67.33	66.12	64.00	66.00
N° 4 (Bias1)	67.33	65.35	65.35	63.93	64.00
N° 5 (Bias1)	65.57	64.00	66.00	64.00	64.00
N° 6 (Bias1)	64.00	63.37	64.00	65.35	65.00
N° 7 (Bias2)	64.12	64.67	64.46	64.00	62.00
N° 8 (Bias2)	64.00	62.81	63.00	63.37	63.33
N° 9 (Bias2)	65.35	66.81	67.33	67.33	64.71
N° 10 (Bias2)	64.00	65.00	64.00	64.00	62.00
N° 11 (Bias2)	65.00	64.00	64.71	64.71	63.37
N° 12 (OFF)	64.46	66.00	64.00	65.71	64.00
N° 13 (OFF)	67.33	67.21	67.67	68.00	64.00
N° 14 (OFF)	66.02	66.00	65.00	64.00	65.00
N° 15 (OFF)	66.37	66.33	66.12	65.90	63.93
N° 16 (OFF)	66.00	65.00	65.12	66.67	66.12

Delta [TRR]

	0.p/cm²	1.7E10.p/cm²	8.5E10.p/cm²	1.7E11.p/cm²	1.7E12.p/cm²
N° 1 (Ref)	---	-6.300E-1	-8.800E-1	-6.700E-1	-8.800E-1
N° 2 (Bias1)	---	5.000E-1	1.190E+0	1.900E-1	-2.810E+0
N° 3 (Bias1)	---	3.330E+0	2.120E+0	0.000E+0	2.000E+0
N° 4 (Bias1)	---	-1.980E+0	-1.980E+0	-3.400E+0	-3.330E+0
N° 5 (Bias1)	---	-1.570E+0	4.300E-1	-1.570E+0	-1.570E+0
N° 6 (Bias1)	---	-6.300E-1	0.000E+0	1.350E+0	1.000E+0
N° 7 (Bias2)	---	5.500E-1	3.400E-1	-1.200E-1	-2.120E+0
N° 8 (Bias2)	---	-1.190E+0	-1.000E+0	-6.300E-1	-6.700E-1
N° 9 (Bias2)	---	1.460E+0	1.980E+0	1.980E+0	-6.400E-1
N° 10 (Bias2)	---	1.000E+0	0.000E+0	0.000E+0	-2.000E+0
N° 11 (Bias2)	---	-1.000E+0	-2.900E-1	-2.900E-1	-1.630E+0
N° 12 (OFF)	---	1.540E+0	-4.600E-1	1.250E+0	-4.600E-1
N° 13 (OFF)	---	-1.200E-1	3.400E-1	6.700E-1	-3.330E+0
N° 14 (OFF)	---	-2.000E-2	-1.020E+0	-2.020E+0	-1.020E+0
N° 15 (OFF)	---	-4.000E-2	-2.500E-1	-4.700E-1	-2.440E+0
N° 16 (OFF)	---	-1.000E+0	-8.800E-1	6.700E-1	1.200E-1
Average (OFF)	---	-7.000E-2	3.520E-1	-6.860E-1	-9.420E-1
σ (OFF)	---	2.127E+0	1.533E+0	1.839E+0	2.346E+0
Average+3σ (OFF)	---	6.311E+0	4.950E+0	4.832E+0	6.096E+0
Average-3σ (OFF)	---	-6.451E+0	-4.246E+0	-6.204E+0	-7.980E+0
Average (Bias1)	---	1.640E-1	2.060E-1	1.880E-1	-1.412E+0
σ (Bias1)	---	1.195E+0	1.108E+0	1.029E+0	7.143E-1
Average+3σ (Bias1)	---	3.750E+0	3.529E+0	3.276E+0	7.310E-1
Average-3σ (Bias1)	---	-3.422E+0	-3.117E+0	-2.900E+0	-3.555E+0
Average (Bias2)	---	7.200E-2	-4.540E-1	2.000E-2	-1.426E+0
σ (Bias2)	---	9.168E-1	5.417E-1	1.300E+0	1.427E+0
Average+3σ (Bias2)	---	2.822E+0	1.171E+0	3.920E+0	2.854E+0
Average-3σ (Bias2)	---	-2.678E+0	-2.079E+0	-3.880E+0	-5.706E+0

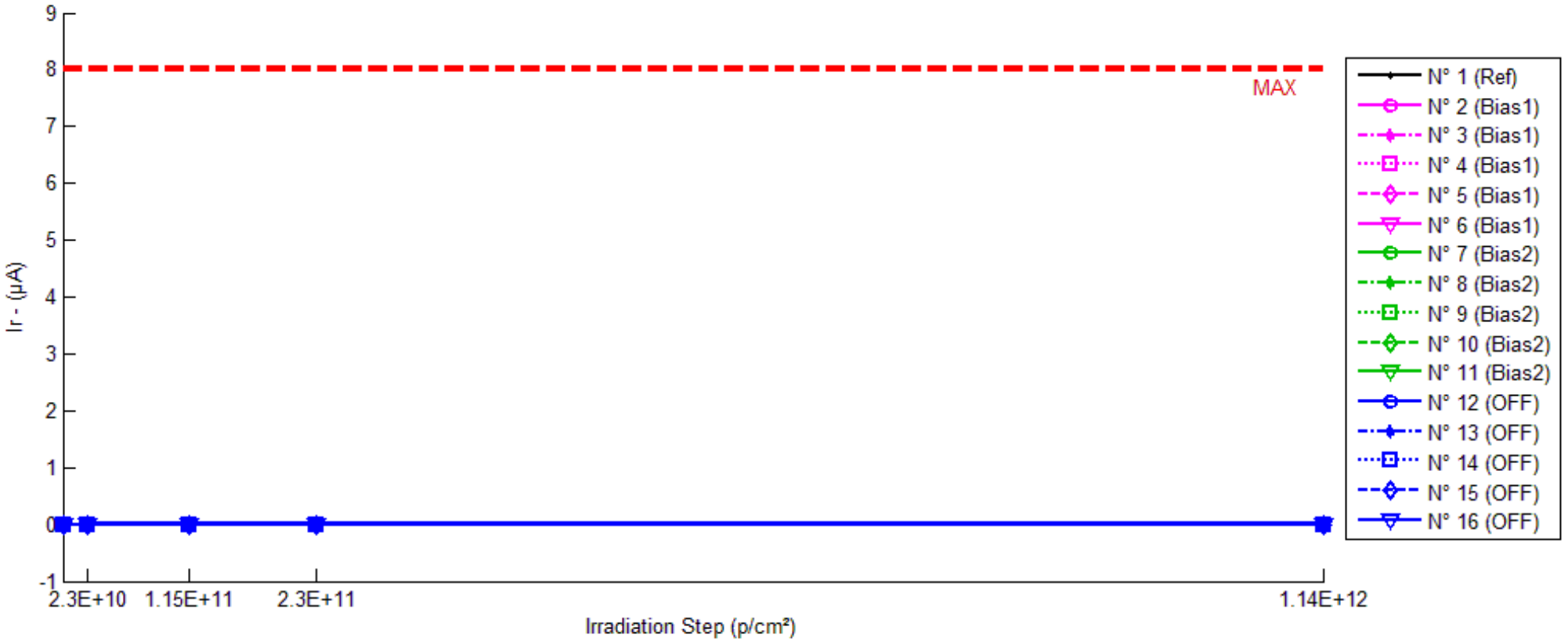
60 MeV proton / detailed results

CONTENTS

60 MeV proton / detailed results

1. Ir

Ta=25°C; VR=6V



60 MeV proton / detailed results

Ir . (µA) **Max = 8.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	7.719E-4	9.356E-4	6.467E-4	1.125E-3	7.078E-4
N° 2 (Bias1)	4.546E-5	2.070E-6	4.097E-5	8.166E-5	2.631E-4
N° 3 (Bias1)	1.210E-5	1.314E-5	2.575E-5	3.765E-5	2.509E-4
N° 4 (Bias1)	1.151E-5	5.633E-6	1.863E-5	6.129E-5	2.409E-4
N° 5 (Bias1)	2.248E-5	3.761E-5	6.284E-5	8.778E-5	3.251E-4
N° 6 (Bias1)	4.385E-6	1.171E-5	5.191E-5	8.653E-5	2.705E-4
N° 7 (Bias2)	1.189E-5	1.389E-5	2.550E-5	9.646E-5	5.293E-4
N° 8 (Bias2)	7.864E-6	7.393E-6	3.154E-5	1.164E-4	5.606E-4
N° 9 (Bias2)	1.234E-5	5.547E-5	7.127E-5	1.548E-4	6.372E-4
N° 10 (Bias2)	7.990E-6	3.076E-6	3.225E-5	1.061E-4	5.813E-4
N° 11 (Bias2)	1.356E-5	5.968E-6	1.368E-5	1.663E-4	5.581E-4
N° 12 (OFF)	2.349E-3	2.739E-3	3.338E-3	3.007E-3	3.389E-3
N° 13 (OFF)	3.620E-6	1.150E-5	7.894E-5	1.490E-4	6.957E-4
N° 14 (OFF)	8.493E-6	7.235E-6	8.414E-5	8.950E-5	5.820E-4
N° 15 (OFF)	7.109E-6	7.435E-6	6.113E-5	8.426E-5	5.927E-4
N° 16 (OFF)	1.134E-5	6.123E-7	5.283E-5	8.087E-5	6.046E-4

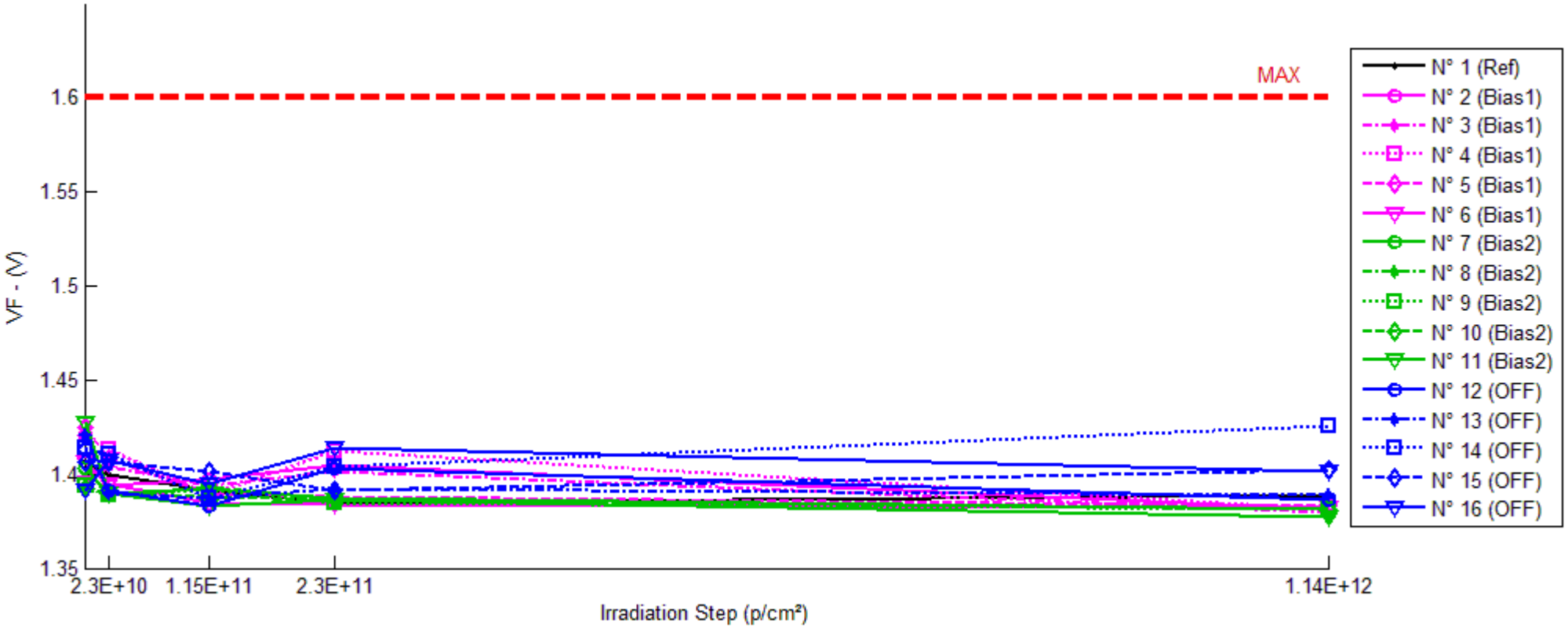
Delta [Ir]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	1.637E-4	-1.252E-4	3.530E-4	-6.409E-5
N° 2 (Bias1)	---	-4.339E-5	-4.495E-6	3.620E-5	2.177E-4
N° 3 (Bias1)	---	1.048E-6	1.365E-5	2.556E-5	2.388E-4
N° 4 (Bias1)	---	-5.878E-6	7.115E-6	4.978E-5	2.294E-4
N° 5 (Bias1)	---	1.513E-5	4.036E-5	6.530E-5	3.026E-4
N° 6 (Bias1)	---	7.325E-6	4.752E-5	8.214E-5	2.661E-4
N° 7 (Bias2)	---	2.002E-6	1.361E-5	8.457E-5	5.174E-4
N° 8 (Bias2)	---	-4.710E-7	2.367E-5	1.085E-4	5.528E-4
N° 9 (Bias2)	---	4.313E-5	5.893E-5	1.425E-4	6.249E-4
N° 10 (Bias2)	---	-4.914E-6	2.426E-5	9.815E-5	5.733E-4
N° 11 (Bias2)	---	-7.596E-6	1.159E-7	1.527E-4	5.446E-4
N° 12 (OFF)	---	3.901E-4	9.887E-4	6.574E-4	1.039E-3
N° 13 (OFF)	---	7.880E-6	7.532E-5	1.454E-4	6.921E-4
N° 14 (OFF)	---	-1.258E-6	7.564E-5	8.101E-5	5.735E-4
N° 15 (OFF)	---	3.257E-7	5.402E-5	7.715E-5	5.856E-4
N° 16 (OFF)	---	-1.073E-5	4.148E-5	6.952E-5	5.933E-4
Average (OFF)	---	-5.153E-6	2.083E-5	5.180E-5	2.509E-4
σ (OFF)	---	2.274E-5	2.222E-5	2.258E-5	3.399E-5
Average+3σ (OFF)	---	6.306E-5	8.749E-5	1.195E-4	3.529E-4
Average-3σ (OFF)	---	-7.337E-5	-4.583E-5	-1.593E-5	1.489E-4
Average (Bias1)	---	6.430E-6	2.412E-5	1.173E-4	5.626E-4
σ (Bias1)	---	2.085E-5	2.179E-5	2.918E-5	4.018E-5
Average+3σ (Bias1)	---	6.899E-5	8.948E-5	2.048E-4	6.831E-4
Average-3σ (Bias1)	---	-5.613E-5	-4.124E-5	2.976E-5	4.420E-4
Average (Bias2)	---	7.726E-5	2.470E-4	2.061E-4	6.968E-4
σ (Bias2)	---	1.750E-4	4.149E-4	2.541E-4	1.973E-4
Average+3σ (Bias2)	---	6.022E-4	1.492E-3	9.684E-4	1.289E-3
Average-3σ (Bias2)	---	-4.477E-4	-9.976E-4	-5.563E-4	1.048E-4

60 MeV proton / detailed results

2. VF

Ta=25°C; If=10mA



60 MeV proton / detailed results

VF . (V) **Max = 1.6**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	1.406	1.400	1.391	1.385	1.389
N° 2 (Bias1)	1.421	1.394	1.397	1.405	1.381
N° 3 (Bias1)	1.394	1.404	1.394	1.401	1.380
N° 4 (Bias1)	1.395	1.413	1.389	1.412	1.381
N° 5 (Bias1)	1.425	1.408	1.390	1.388	1.383
N° 6 (Bias1)	1.406	1.395	1.385	1.384	1.382
N° 7 (Bias2)	1.403	1.390	1.392	1.387	1.381
N° 8 (Bias2)	1.393	1.389	1.393	1.386	1.377
N° 9 (Bias2)	1.394	1.389	1.391	1.385	1.381
N° 10 (Bias2)	1.392	1.390	1.388	1.386	1.381
N° 11 (Bias2)	1.427	1.390	1.383	1.386	1.377
N° 12 (OFF)	1.413	1.391	1.383	1.403	1.386
N° 13 (OFF)	1.421	1.390	1.387	1.392	1.389
N° 14 (OFF)	1.414	1.411	1.387	1.404	1.426
N° 15 (OFF)	1.406	1.406	1.401	1.391	1.402
N° 16 (OFF)	1.391	1.407	1.395	1.414	1.401

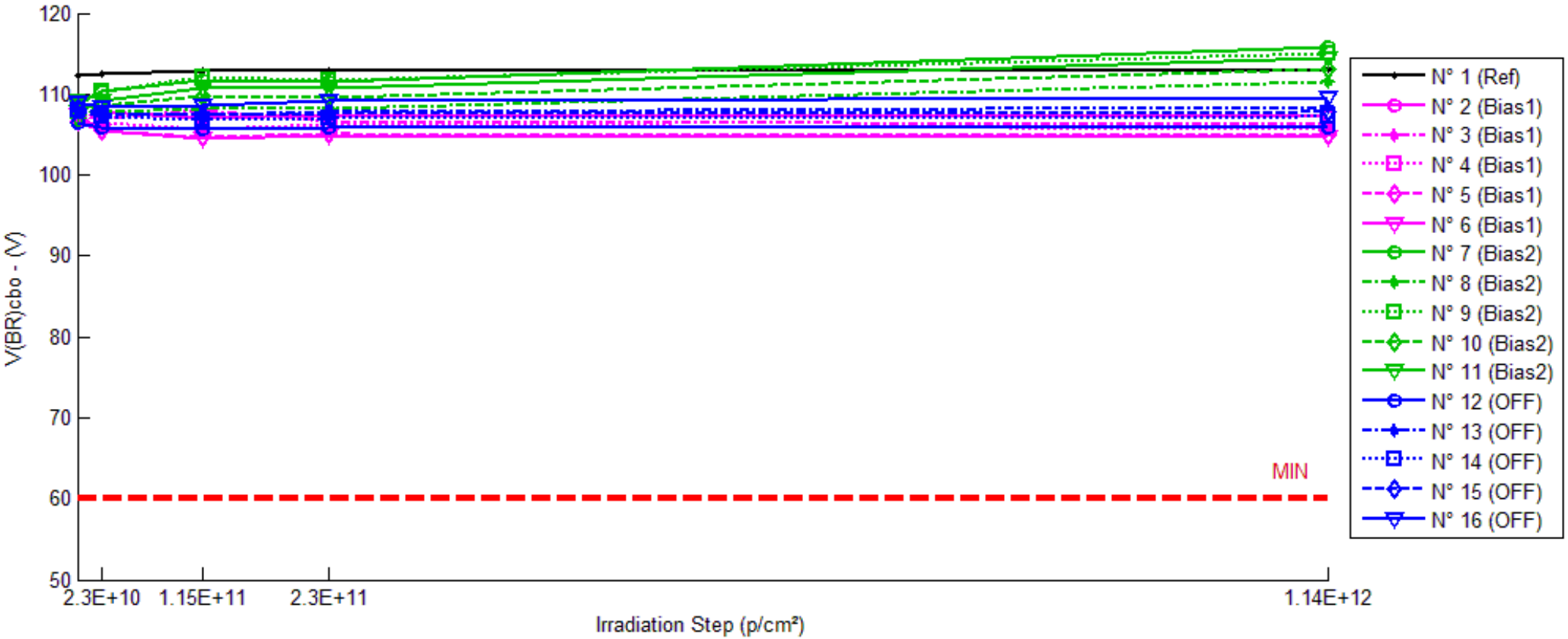
Delta [VF]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	-5.904E-3	-1.494E-2	-2.107E-2	-1.740E-2
N° 2 (Bias1)	---	-2.673E-2	-2.402E-2	-1.590E-2	-3.963E-2
N° 3 (Bias1)	---	9.543E-3	-6.130E-4	6.538E-3	-1.402E-2
N° 4 (Bias1)	---	1.806E-2	-6.153E-3	1.768E-2	-1.415E-2
N° 5 (Bias1)	---	-1.675E-2	-3.559E-2	-3.765E-2	-4.195E-2
N° 6 (Bias1)	---	-1.102E-2	-2.026E-2	-2.132E-2	-2.317E-2
N° 7 (Bias2)	---	-1.307E-2	-1.119E-2	-1.661E-2	-2.283E-2
N° 8 (Bias2)	---	-3.956E-3	-1.730E-4	-6.673E-3	-1.630E-2
N° 9 (Bias2)	---	-4.784E-3	-2.976E-3	-8.769E-3	-1.352E-2
N° 10 (Bias2)	---	-2.032E-3	-3.827E-3	-6.004E-3	-1.079E-2
N° 11 (Bias2)	---	-3.610E-2	-4.354E-2	-4.007E-2	-4.916E-2
N° 12 (OFF)	---	-2.125E-2	-2.957E-2	-9.717E-3	-2.656E-2
N° 13 (OFF)	---	-3.086E-2	-3.421E-2	-2.892E-2	-3.175E-2
N° 14 (OFF)	---	-2.752E-3	-2.747E-2	-9.971E-3	1.228E-2
N° 15 (OFF)	---	-7.100E-5	-5.511E-3	-1.511E-2	-4.030E-3
N° 16 (OFF)	---	1.623E-2	3.578E-3	2.292E-2	9.411E-3
Average (OFF)	---	-5.380E-3	-1.733E-2	-1.013E-2	-2.658E-2
σ (OFF)	---	1.863E-2	1.406E-2	2.218E-2	1.351E-2
Average+3σ (OFF)	---	5.052E-2	2.487E-2	5.640E-2	1.395E-2
Average-3σ (OFF)	---	-6.128E-2	-5.952E-2	-7.666E-2	-6.712E-2
Average (Bias1)	---	-1.199E-2	-1.234E-2	-1.563E-2	-2.252E-2
σ (Bias1)	---	1.413E-2	1.791E-2	1.430E-2	1.555E-2
Average+3σ (Bias1)	---	3.039E-2	4.139E-2	2.729E-2	2.412E-2
Average-3σ (Bias1)	---	-5.437E-2	-6.606E-2	-5.854E-2	-6.916E-2
Average (Bias2)	---	-7.739E-3	-1.864E-2	-8.160E-3	-8.130E-3
σ (Bias2)	---	1.854E-2	1.663E-2	1.905E-2	2.024E-2
Average+3σ (Bias2)	---	4.789E-2	3.124E-2	4.898E-2	5.259E-2
Average-3σ (Bias2)	---	-6.336E-2	-6.851E-2	-6.530E-2	-6.885E-2

60 MeV proton / detailed results

3. V(BR)cbo

Ta=25°C; Ic=100µA; Ib=0; If=0



60 MeV proton / detailed results

V(BR)cbo . (V) **Min = 60.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	112.27	112.46	112.90	112.91	113.14
N° 2 (Bias1)	109.15	107.78	107.00	107.46	107.31
N° 3 (Bias1)	108.28	107.04	107.93	106.63	106.21
N° 4 (Bias1)	107.77	106.53	105.75	106.19	105.68
N° 5 (Bias1)	106.60	105.51	104.70	105.06	104.84
N° 6 (Bias1)	107.36	105.57	104.59	104.95	104.79
N° 7 (Bias2)	108.84	110.36	111.68	111.60	115.74
N° 8 (Bias2)	107.86	107.82	108.16	108.18	111.43
N° 9 (Bias2)	108.91	110.31	112.02	111.64	114.96
N° 10 (Bias2)	107.09	108.59	109.86	109.65	113.03
N° 11 (Bias2)	107.89	109.17	110.78	110.68	114.38
N° 12 (OFF)	106.49	105.77	105.71	105.83	105.94
N° 13 (OFF)	107.83	107.34	107.37	107.88	108.38
N° 14 (OFF)	108.06	107.23	106.87	107.09	107.32
N° 15 (OFF)	108.18	107.70	107.49	107.70	107.76
N° 16 (OFF)	108.94	108.49	108.62	109.12	109.53

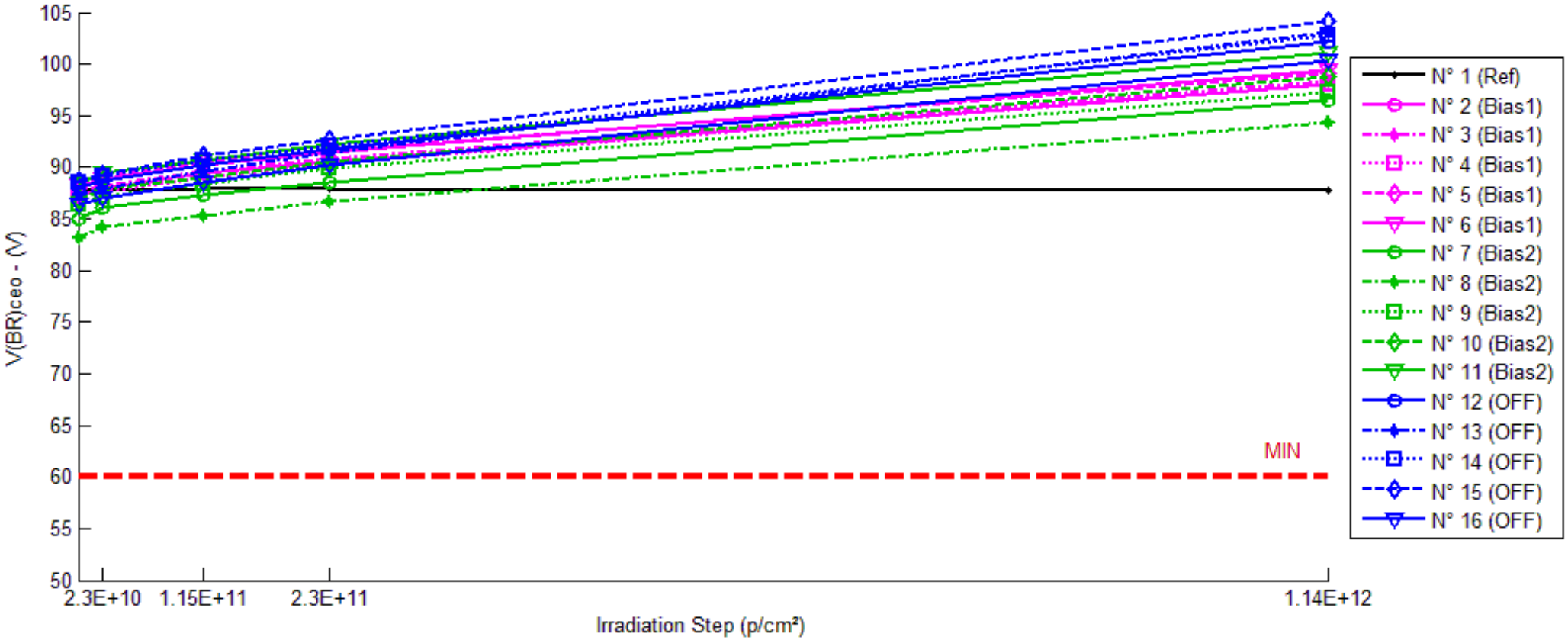
Delta [V(BR)cbo]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	1.930E-1	6.301E-1	6.480E-1	8.712E-1
N° 2 (Bias1)	---	-1.372E+0	-2.151E+0	-1.691E+0	-1.838E+0
N° 3 (Bias1)	---	-1.238E+0	-3.545E-1	-1.655E+0	-2.073E+0
N° 4 (Bias1)	---	-1.245E+0	-2.020E+0	-1.585E+0	-2.088E+0
N° 5 (Bias1)	---	-1.092E+0	-1.893E+0	-1.540E+0	-1.752E+0
N° 6 (Bias1)	---	-1.790E+0	-2.779E+0	-2.411E+0	-2.577E+0
N° 7 (Bias2)	---	1.525E+0	2.845E+0	2.765E+0	6.899E+0
N° 8 (Bias2)	---	-4.820E-2	2.979E-1	3.107E-1	3.563E+0
N° 9 (Bias2)	---	1.397E+0	3.104E+0	2.725E+0	6.049E+0
N° 10 (Bias2)	---	1.495E+0	2.766E+0	2.554E+0	5.934E+0
N° 11 (Bias2)	---	1.277E+0	2.893E+0	2.791E+0	6.489E+0
N° 12 (OFF)	---	-7.172E-1	-7.765E-1	-6.589E-1	-5.457E-1
N° 13 (OFF)	---	-4.954E-1	-4.623E-1	5.360E-2	5.536E-1
N° 14 (OFF)	---	-8.366E-1	-1.189E+0	-9.724E-1	-7.460E-1
N° 15 (OFF)	---	-4.783E-1	-6.928E-1	-4.853E-1	-4.184E-1
N° 16 (OFF)	---	-4.430E-1	-3.176E-1	1.800E-1	5.931E-1
Average (OFF)	---	-1.347E+0	-1.839E+0	-1.776E+0	-2.066E+0
σ (OFF)	---	2.667E-1	8.972E-1	3.595E-1	3.210E-1
Average+3σ (OFF)	---	-5.470E-1	8.520E-1	-6.978E-1	-1.103E+0
Average-3σ (OFF)	---	-2.147E+0	-4.531E+0	-2.855E+0	-3.029E+0
Average (Bias1)	---	1.129E+0	2.381E+0	2.229E+0	5.787E+0
σ (Bias1)	---	6.653E-1	1.171E+0	1.076E+0	1.300E+0
Average+3σ (Bias1)	---	3.125E+0	5.895E+0	5.458E+0	9.688E+0
Average-3σ (Bias1)	---	-8.666E-1	-1.133E+0	-1.000E+0	1.885E+0
Average (Bias2)	---	-5.941E-1	-6.877E-1	-3.766E-1	-1.127E-1
σ (Bias2)	---	1.732E-1	3.344E-1	4.851E-1	6.372E-1
Average+3σ (Bias2)	---	-7.461E-2	3.155E-1	1.079E+0	1.799E+0
Average-3σ (Bias2)	---	-1.114E+0	-1.691E+0	-1.832E+0	-2.024E+0

60 MeV proton / detailed results

4. V(BR)ceo

Ta=25°C; Ic=1mA; Ib=0; If=0



60 MeV proton / detailed results

V(BR)ceo . (V) **Min = 60.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	87.82	87.79	87.90	87.88	87.80
N° 2 (Bias1)	87.36	87.95	89.39	90.56	97.97
N° 3 (Bias1)	87.74	88.24	89.63	90.82	98.38
N° 4 (Bias1)	87.15	87.62	89.05	90.43	98.03
N° 5 (Bias1)	88.63	89.16	90.48	91.65	99.11
N° 6 (Bias1)	88.21	88.78	90.17	91.50	99.48
N° 7 (Bias2)	85.01	86.11	87.25	88.46	96.52
N° 8 (Bias2)	83.18	84.19	85.38	86.65	94.42
N° 9 (Bias2)	86.32	87.19	88.33	89.84	97.32
N° 10 (Bias2)	86.85	87.91	89.06	90.48	98.72
N° 11 (Bias2)	88.35	89.48	90.68	92.17	101.09
N° 12 (OFF)	88.08	88.63	90.24	91.69	102.10
N° 13 (OFF)	87.24	87.97	89.67	91.43	103.02
N° 14 (OFF)	88.46	89.09	90.61	92.11	102.81
N° 15 (OFF)	88.71	89.31	91.08	92.67	104.09
N° 16 (OFF)	86.39	87.05	88.50	90.14	100.34

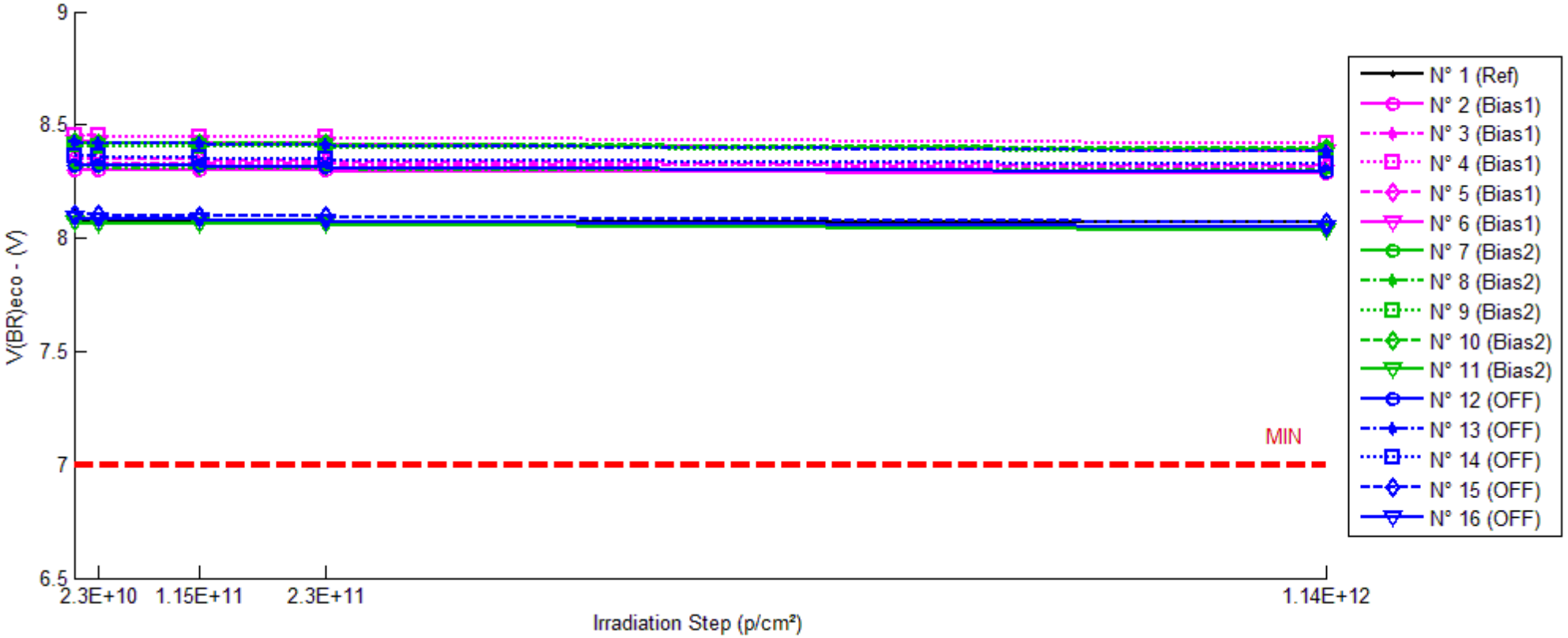
Delta [V(BR)ceo]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	-3.214E-2	7.933E-2	5.966E-2	-2.527E-2
N° 2 (Bias1)	---	5.877E-1	2.030E+0	3.199E+0	1.061E+1
N° 3 (Bias1)	---	5.043E-1	1.890E+0	3.082E+0	1.065E+1
N° 4 (Bias1)	---	4.683E-1	1.900E+0	3.285E+0	1.088E+1
N° 5 (Bias1)	---	5.253E-1	1.853E+0	3.021E+0	1.047E+1
N° 6 (Bias1)	---	5.708E-1	1.968E+0	3.293E+0	1.128E+1
N° 7 (Bias2)	---	1.099E+0	2.232E+0	3.445E+0	1.150E+1
N° 8 (Bias2)	---	1.011E+0	2.203E+0	3.467E+0	1.124E+1
N° 9 (Bias2)	---	8.736E-1	2.012E+0	3.524E+0	1.101E+1
N° 10 (Bias2)	---	1.060E+0	2.209E+0	3.624E+0	1.187E+1
N° 11 (Bias2)	---	1.127E+0	2.332E+0	3.822E+0	1.274E+1
N° 12 (OFF)	---	5.477E-1	2.161E+0	3.611E+0	1.402E+1
N° 13 (OFF)	---	7.230E-1	2.431E+0	4.191E+0	1.578E+1
N° 14 (OFF)	---	6.366E-1	2.151E+0	3.652E+0	1.436E+1
N° 15 (OFF)	---	5.984E-1	2.373E+0	3.964E+0	1.539E+1
N° 16 (OFF)	---	6.636E-1	2.110E+0	3.750E+0	1.395E+1
Average (OFF)	---	5.313E-1	1.928E+0	3.176E+0	1.078E+1
σ (OFF)	---	4.867E-2	7.027E-2	1.214E-1	3.159E-1
Average+3σ (OFF)	---	6.773E-1	2.139E+0	3.540E+0	1.173E+1
Average-3σ (OFF)	---	3.853E-1	1.718E+0	2.812E+0	9.830E+0
Average (Bias1)	---	1.034E+0	2.198E+0	3.577E+0	1.167E+1
σ (Bias1)	---	9.973E-2	1.158E-1	1.539E-1	6.763E-1
Average+3σ (Bias1)	---	1.333E+0	2.545E+0	4.038E+0	1.370E+1
Average-3σ (Bias1)	---	7.350E-1	1.850E+0	3.115E+0	9.643E+0
Average (Bias2)	---	6.339E-1	2.245E+0	3.834E+0	1.470E+1
σ (Bias2)	---	6.621E-2	1.457E-1	2.420E-1	8.340E-1
Average+3σ (Bias2)	---	8.325E-1	2.682E+0	4.560E+0	1.720E+1
Average-3σ (Bias2)	---	4.352E-1	1.808E+0	3.108E+0	1.220E+1

60 MeV proton / detailed results

5. V(BR)eco

Ta=25°C; Ic=0; Ie=100µA; If=0



60 MeV proton / detailed results

V(BR)eco . (V) **Min = 7.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	8.070	8.069	8.073	8.073	8.070
N° 2 (Bias1)	8.299	8.298	8.299	8.299	8.289
N° 3 (Bias1)	8.332	8.329	8.332	8.328	8.317
N° 4 (Bias1)	8.455	8.451	8.449	8.446	8.420
N° 5 (Bias1)	8.354	8.350	8.348	8.345	8.318
N° 6 (Bias1)	8.427	8.423	8.421	8.417	8.386
N° 7 (Bias2)	8.422	8.420	8.418	8.413	8.390
N° 8 (Bias2)	8.316	8.312	8.310	8.309	8.300
N° 9 (Bias2)	8.410	8.407	8.406	8.404	8.383
N° 10 (Bias2)	8.424	8.421	8.420	8.419	8.396
N° 11 (Bias2)	8.067	8.064	8.063	8.060	8.037
N° 12 (OFF)	8.321	8.318	8.321	8.315	8.293
N° 13 (OFF)	8.424	8.422	8.418	8.411	8.385
N° 14 (OFF)	8.363	8.360	8.358	8.352	8.327
N° 15 (OFF)	8.103	8.102	8.101	8.098	8.072
N° 16 (OFF)	8.088	8.085	8.081	8.074	8.046

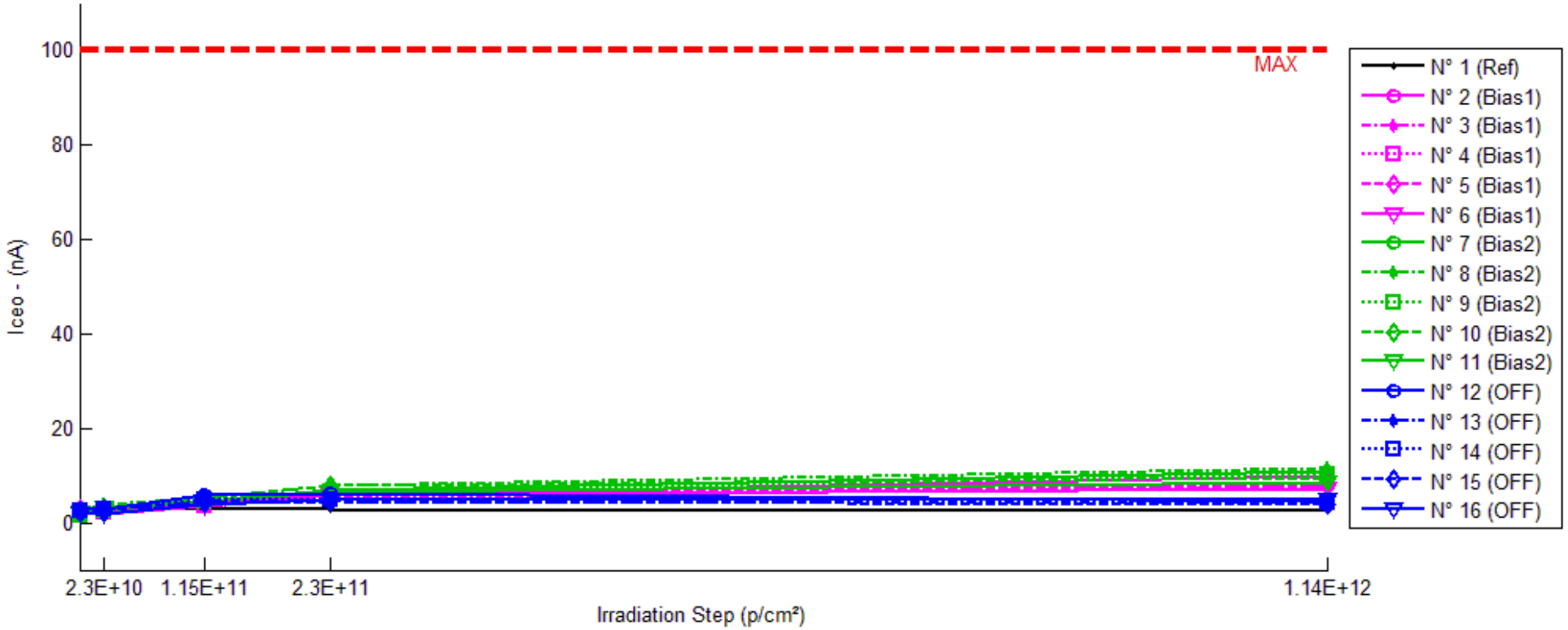
Delta [V(BR)eco]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	-3.450E-4	3.730E-3	3.154E-3	6.970E-4
N° 2 (Bias1)	---	-9.760E-4	-5.260E-4	-8.440E-4	-1.048E-2
N° 3 (Bias1)	---	-2.773E-3	4.300E-5	-4.080E-3	-1.480E-2
N° 4 (Bias1)	---	-3.536E-3	-5.884E-3	-8.415E-3	-3.447E-2
N° 5 (Bias1)	---	-3.271E-3	-5.791E-3	-9.084E-3	-3.597E-2
N° 6 (Bias1)	---	-4.138E-3	-6.101E-3	-9.876E-3	-4.053E-2
N° 7 (Bias2)	---	-1.901E-3	-4.122E-3	-8.349E-3	-3.138E-2
N° 8 (Bias2)	---	-4.004E-3	-6.075E-3	-7.188E-3	-1.623E-2
N° 9 (Bias2)	---	-2.848E-3	-3.796E-3	-5.715E-3	-2.695E-2
N° 10 (Bias2)	---	-2.416E-3	-4.126E-3	-5.187E-3	-2.824E-2
N° 11 (Bias2)	---	-2.730E-3	-3.563E-3	-6.909E-3	-2.983E-2
N° 12 (OFF)	---	-3.103E-3	5.100E-5	-5.899E-3	-2.768E-2
N° 13 (OFF)	---	-1.704E-3	-5.758E-3	-1.266E-2	-3.838E-2
N° 14 (OFF)	---	-2.398E-3	-5.164E-3	-1.123E-2	-3.619E-2
N° 15 (OFF)	---	-1.595E-3	-2.876E-3	-5.900E-3	-3.179E-2
N° 16 (OFF)	---	-2.772E-3	-6.580E-3	-1.336E-2	-4.124E-2
Average (OFF)	---	-2.939E-3	-3.652E-3	-6.460E-3	-2.725E-2
σ (OFF)	---	1.203E-3	3.122E-3	3.859E-3	1.361E-2
Average+3σ (OFF)	---	6.691E-4	5.713E-3	5.118E-3	1.358E-2
Average-3σ (OFF)	---	-6.547E-3	-1.302E-2	-1.804E-2	-6.808E-2
Average (Bias1)	---	-2.780E-3	-4.336E-3	-6.670E-3	-2.653E-2
σ (Bias1)	---	7.763E-4	1.000E-3	1.251E-3	5.993E-3
Average+3σ (Bias1)	---	-4.510E-4	-1.335E-3	-2.918E-3	-8.549E-3
Average-3σ (Bias1)	---	-5.109E-3	-7.338E-3	-1.042E-2	-4.450E-2
Average (Bias2)	---	-2.314E-3	-4.065E-3	-9.810E-3	-3.506E-2
σ (Bias2)	---	6.573E-4	2.681E-3	3.652E-3	5.376E-3
Average+3σ (Bias2)	---	-3.424E-4	3.978E-3	1.146E-3	-1.893E-2
Average-3σ (Bias2)	---	-4.286E-3	-1.211E-2	-2.077E-2	-5.118E-2

60 MeV proton / detailed results

6. Iceo

Ta=25°C; Vce=20V; If=0; Ib=0



60 MeV proton / detailed results

Iceo . (nA) **Max = 100.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	2.581	2.619	3.060	2.925	2.519
N° 2 (Bias1)	2.234	2.652	4.079	5.801	9.746
N° 3 (Bias1)	2.317	2.613	4.878	5.134	7.768
N° 4 (Bias1)	2.030	2.238	3.663	5.549	8.443
N° 5 (Bias1)	2.971	2.675	4.082	5.848	7.931
N° 6 (Bias1)	1.743	1.885	3.584	5.872	7.055
N° 7 (Bias2)	1.795	2.731	4.676	6.879	10.933
N° 8 (Bias2)	2.764	3.979	5.240	7.960	11.673
N° 9 (Bias2)	1.667	2.620	4.581	6.597	10.265
N° 10 (Bias2)	2.597	3.320	5.274	8.012	9.595
N° 11 (Bias2)	2.192	3.236	4.661	6.550	8.467
N° 12 (OFF)	2.887	2.967	5.973	6.130	4.651
N° 13 (OFF)	2.053	2.733	4.400	4.574	4.178
N° 14 (OFF)	2.521	2.746	4.756	4.989	4.094
N° 15 (OFF)	2.478	2.975	4.071	4.445	3.707
N° 16 (OFF)	1.717	1.942	4.029	4.939	4.852

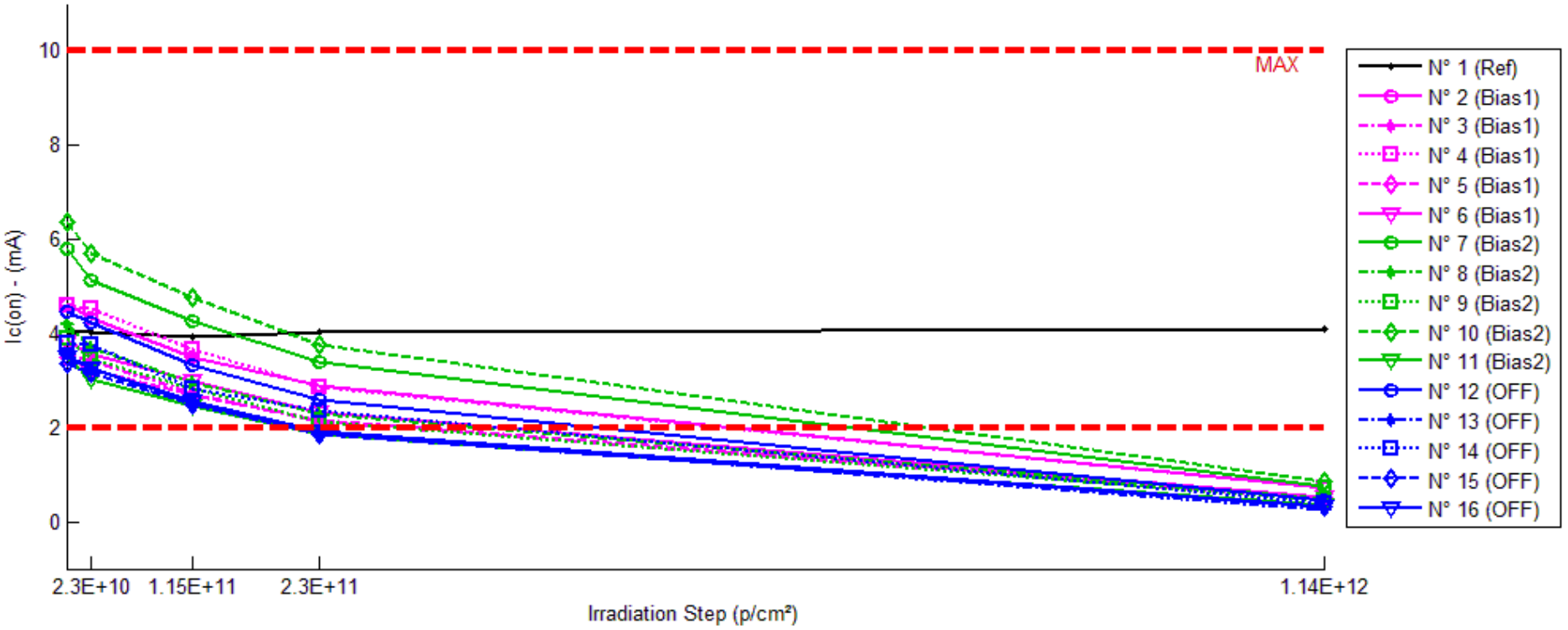
Delta [Iceo]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	3.834E-2	4.789E-1	3.447E-1	-6.161E-2
N° 2 (Bias1)	---	4.174E-1	1.845E+0	3.567E+0	7.511E+0
N° 3 (Bias1)	---	2.959E-1	2.561E+0	2.817E+0	5.451E+0
N° 4 (Bias1)	---	2.082E-1	1.633E+0	3.519E+0	6.413E+0
N° 5 (Bias1)	---	-2.960E-1	1.112E+0	2.877E+0	4.961E+0
N° 6 (Bias1)	---	1.418E-1	1.840E+0	4.129E+0	5.312E+0
N° 7 (Bias2)	---	9.361E-1	2.880E+0	5.083E+0	9.138E+0
N° 8 (Bias2)	---	1.215E+0	2.476E+0	5.196E+0	8.910E+0
N° 9 (Bias2)	---	9.526E-1	2.914E+0	4.929E+0	8.598E+0
N° 10 (Bias2)	---	7.232E-1	2.677E+0	5.415E+0	6.998E+0
N° 11 (Bias2)	---	1.044E+0	2.469E+0	4.358E+0	6.275E+0
N° 12 (OFF)	---	8.004E-2	3.086E+0	3.244E+0	1.764E+0
N° 13 (OFF)	---	6.798E-1	2.346E+0	2.521E+0	2.125E+0
N° 14 (OFF)	---	2.248E-1	2.235E+0	2.468E+0	1.573E+0
N° 15 (OFF)	---	4.967E-1	1.593E+0	1.967E+0	1.229E+0
N° 16 (OFF)	---	2.253E-1	2.312E+0	3.222E+0	3.136E+0
Average (OFF)	---	1.535E-1	1.798E+0	3.382E+0	5.930E+0
σ (OFF)	---	2.716E-1	5.207E-1	5.443E-1	1.035E+0
Average+3σ (OFF)	---	9.682E-1	3.360E+0	5.015E+0	9.035E+0
Average-3σ (OFF)	---	-6.613E-1	2.359E-1	1.749E+0	2.824E+0
Average (Bias1)	---	9.742E-1	2.683E+0	4.996E+0	7.984E+0
σ (Bias1)	---	1.788E-1	2.127E-1	3.983E-1	1.270E+0
Average+3σ (Bias1)	---	1.511E+0	3.321E+0	6.191E+0	1.180E+1
Average-3σ (Bias1)	---	4.378E-1	2.045E+0	3.801E+0	4.172E+0
Average (Bias2)	---	3.413E-1	2.314E+0	2.684E+0	1.965E+0
σ (Bias2)	---	2.419E-1	5.299E-1	5.455E-1	7.299E-1
Average+3σ (Bias2)	---	1.067E+0	3.904E+0	4.321E+0	4.155E+0
Average-3σ (Bias2)	---	-3.843E-1	7.248E-1	1.048E+0	-2.243E-1

60 MeV proton / detailed results

7. Ic(on)

Ta=25°C;Vce=5V; If=1mA; Ib=0



60 MeV proton / detailed results

Ic(on) . (mA) **Min = 2.0 Max = 10.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	4.057	4.028	3.923	4.032	4.086
N° 2 (Bias1)	4.636	4.330	3.495	2.881	0.714
N° 3 (Bias1)	3.556	3.424	2.736	2.111	0.477
N° 4 (Bias1)	4.600	4.522	3.673	2.855	0.715
N° 5 (Bias1)	3.484	3.223	2.682	2.155	0.510
N° 6 (Bias1)	3.821	3.579	2.986	2.310	0.536
N° 7 (Bias2)	5.808	5.134	4.257	3.400	0.771
N° 8 (Bias2)	4.204	3.699	2.965	2.277	0.478
N° 9 (Bias2)	3.901	3.454	2.811	2.141	0.464
N° 10 (Bias2)	6.365	5.692	4.752	3.768	0.868
N° 11 (Bias2)	3.508	3.040	2.443	1.867	0.369
N° 12 (OFF)	4.464	4.228	3.325	2.608	0.457
N° 13 (OFF)	3.552	3.278	2.527	1.881	0.257
N° 14 (OFF)	3.790	3.760	2.830	2.352	0.374
N° 15 (OFF)	3.363	3.147	2.503	1.846	0.310
N° 16 (OFF)	3.500	3.266	2.547	1.924	0.304

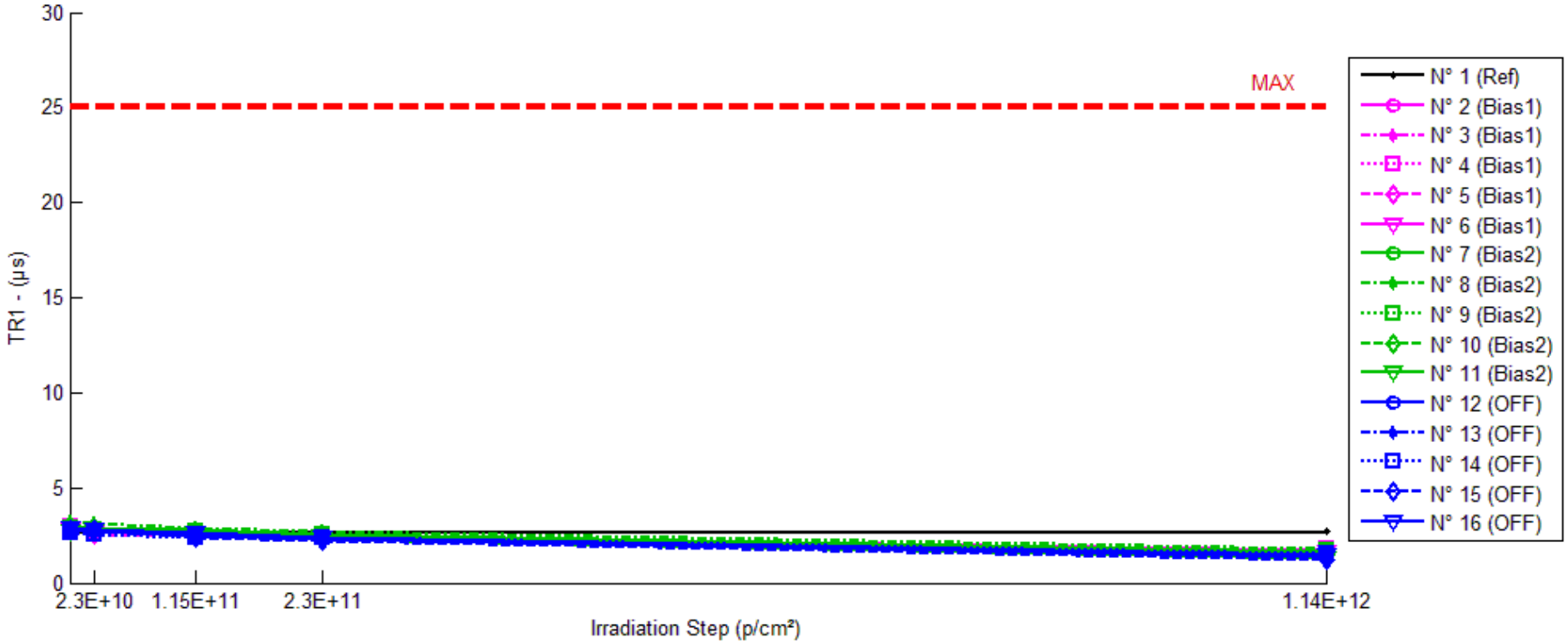
Delta [Ic(on)]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	-2.823E-2	-1.335E-1	-2.436E-2	2.928E-2
N° 2 (Bias1)	---	-3.067E-1	-1.142E+0	-1.755E+0	-3.922E+0
N° 3 (Bias1)	---	-1.317E-1	-8.198E-1	-1.445E+0	-3.078E+0
N° 4 (Bias1)	---	-7.732E-2	-9.262E-1	-1.745E+0	-3.884E+0
N° 5 (Bias1)	---	-2.610E-1	-8.017E-1	-1.329E+0	-2.974E+0
N° 6 (Bias1)	---	-2.428E-1	-8.357E-1	-1.512E+0	-3.286E+0
N° 7 (Bias2)	---	-6.746E-1	-1.551E+0	-2.408E+0	-5.037E+0
N° 8 (Bias2)	---	-5.049E-1	-1.239E+0	-1.927E+0	-3.725E+0
N° 9 (Bias2)	---	-4.469E-1	-1.090E+0	-1.760E+0	-3.437E+0
N° 10 (Bias2)	---	-6.723E-1	-1.612E+0	-2.597E+0	-5.497E+0
N° 11 (Bias2)	---	-4.684E-1	-1.065E+0	-1.641E+0	-3.139E+0
N° 12 (OFF)	---	-2.360E-1	-1.139E+0	-1.855E+0	-4.007E+0
N° 13 (OFF)	---	-2.735E-1	-1.025E+0	-1.671E+0	-3.295E+0
N° 14 (OFF)	---	-3.053E-2	-9.598E-1	-1.438E+0	-3.416E+0
N° 15 (OFF)	---	-2.165E-1	-8.600E-1	-1.517E+0	-3.053E+0
N° 16 (OFF)	---	-2.341E-1	-9.527E-1	-1.576E+0	-3.196E+0
Average (OFF)	---	-2.039E-1	-9.050E-1	-1.557E+0	-3.429E+0
σ (OFF)	---	9.563E-2	1.407E-1	1.879E-1	4.475E-1
Average+3σ (OFF)	---	8.299E-2	-4.830E-1	-9.934E-1	-2.086E+0
Average-3σ (OFF)	---	-4.908E-1	-1.327E+0	-2.121E+0	-4.771E+0
Average (Bias1)	---	-5.534E-1	-1.311E+0	-2.067E+0	-4.167E+0
σ (Bias1)	---	1.115E-1	2.565E-1	4.162E-1	1.038E+0
Average+3σ (Bias1)	---	-2.189E-1	-5.417E-1	-8.179E-1	-1.052E+0
Average-3σ (Bias1)	---	-8.879E-1	-2.081E+0	-3.315E+0	-7.282E+0
Average (Bias2)	---	-1.981E-1	-9.872E-1	-1.611E+0	-3.393E+0
σ (Bias2)	---	9.596E-2	1.032E-1	1.607E-1	3.680E-1
Average+3σ (Bias2)	---	8.977E-2	-6.777E-1	-1.129E+0	-2.289E+0
Average-3σ (Bias2)	---	-4.860E-1	-1.297E+0	-2.093E+0	-4.497E+0

60 MeV proton / detailed results

8. TR1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



60 MeV proton / detailed results

TR1 . (µs) **Max = 25.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	2.64	2.64	2.72	2.60	2.72
N° 2 (Bias1)	2.92	2.80	2.68	2.44	1.72
N° 3 (Bias1)	2.80	2.76	2.44	2.40	1.44
N° 4 (Bias1)	3.00	2.72	2.60	2.52	1.80
N° 5 (Bias1)	2.68	2.56	2.44	2.24	1.64
N° 6 (Bias1)	2.80	2.64	2.60	2.28	1.64
N° 7 (Bias2)	3.00	2.88	2.76	2.56	1.64
N° 8 (Bias2)	3.20	3.16	2.92	2.72	1.76
N° 9 (Bias2)	2.92	2.80	2.68	2.52	1.68
N° 10 (Bias2)	2.92	2.76	2.64	2.48	1.64
N° 11 (Bias2)	2.68	2.72	2.44	2.28	1.32
N° 12 (OFF)	2.68	2.68	2.48	2.28	1.40
N° 13 (OFF)	2.84	2.84	2.44	2.40	1.40
N° 14 (OFF)	2.64	2.56	2.36	2.36	1.52
N° 15 (OFF)	2.76	2.76	2.40	2.24	1.24
N° 16 (OFF)	2.88	2.80	2.64	2.36	1.44

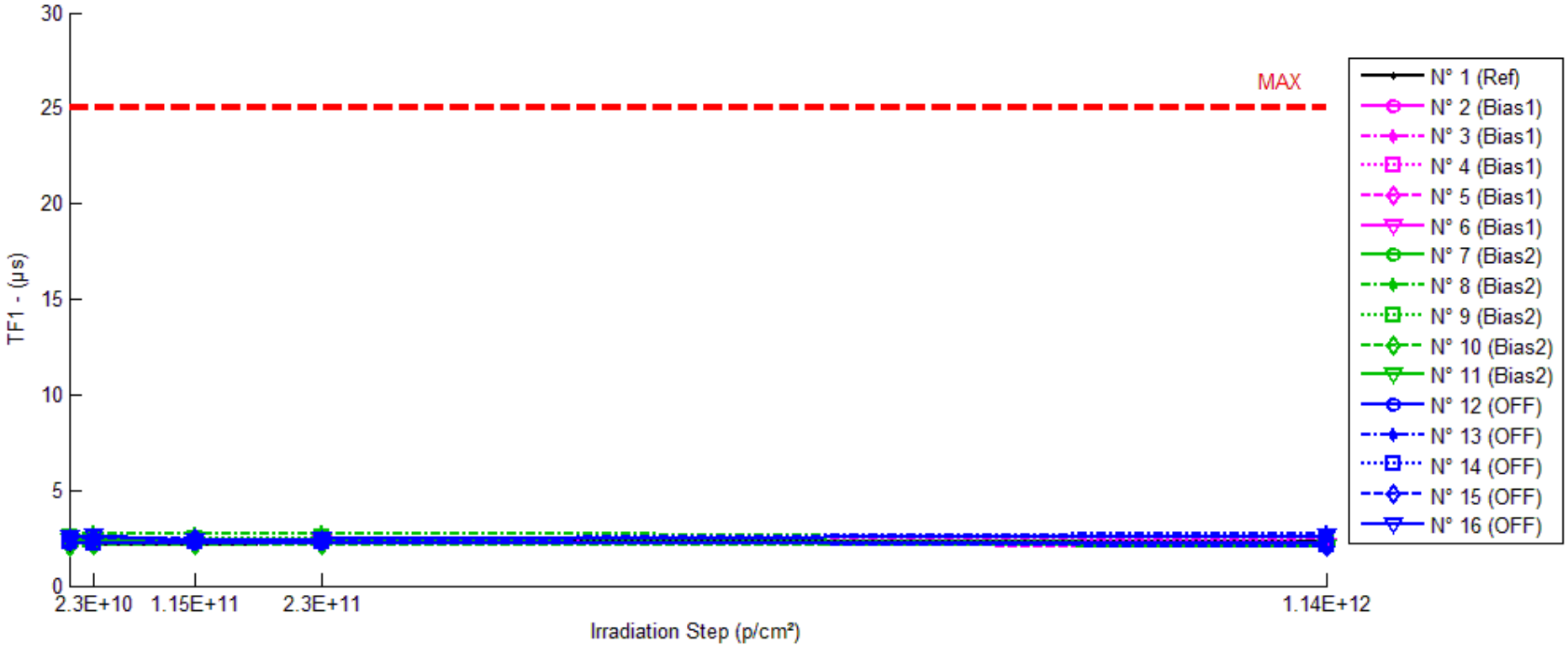
Delta [TR1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	0.000E+0	8.000E-2	-4.000E-2	8.000E-2
N° 2 (Bias1)	---	-1.200E-1	-2.400E-1	-4.800E-1	-1.200E+0
N° 3 (Bias1)	---	-4.000E-2	-3.600E-1	-4.000E-1	-1.360E+0
N° 4 (Bias1)	---	-2.800E-1	-4.000E-1	-4.800E-1	-1.200E+0
N° 5 (Bias1)	---	-1.200E-1	-2.400E-1	-4.400E-1	-1.040E+0
N° 6 (Bias1)	---	-1.600E-1	-2.000E-1	-5.200E-1	-1.160E+0
N° 7 (Bias2)	---	-1.200E-1	-2.400E-1	-4.400E-1	-1.360E+0
N° 8 (Bias2)	---	-4.000E-2	-2.800E-1	-4.800E-1	-1.440E+0
N° 9 (Bias2)	---	-1.200E-1	-2.400E-1	-4.000E-1	-1.240E+0
N° 10 (Bias2)	---	-1.600E-1	-2.800E-1	-4.400E-1	-1.280E+0
N° 11 (Bias2)	---	4.000E-2	-2.400E-1	-4.000E-1	-1.360E+0
N° 12 (OFF)	---	0.000E+0	-2.000E-1	-4.000E-1	-1.280E+0
N° 13 (OFF)	---	0.000E+0	-4.000E-1	-4.400E-1	-1.440E+0
N° 14 (OFF)	---	-8.000E-2	-2.800E-1	-2.800E-1	-1.120E+0
N° 15 (OFF)	---	0.000E+0	-3.600E-1	-5.200E-1	-1.520E+0
N° 16 (OFF)	---	-8.000E-2	-2.400E-1	-5.200E-1	-1.440E+0
Average (OFF)	---	-1.440E-1	-2.880E-1	-4.640E-1	-1.192E+0
σ (OFF)	---	8.764E-2	8.672E-2	4.561E-2	1.145E-1
Average+3σ (OFF)	---	1.189E-1	-2.785E-2	-3.272E-1	-8.484E-1
Average-3σ (OFF)	---	-4.069E-1	-5.482E-1	-6.008E-1	-1.536E+0
Average (Bias1)	---	-8.000E-2	-2.560E-1	-4.320E-1	-1.336E+0
σ (Bias1)	---	8.000E-2	2.191E-2	3.347E-2	7.797E-2
Average+3σ (Bias1)	---	1.600E-1	-1.903E-1	-3.316E-1	-1.102E+0
Average-3σ (Bias1)	---	-3.200E-1	-3.217E-1	-5.324E-1	-1.570E+0
Average (Bias2)	---	-3.200E-2	-2.960E-1	-4.320E-1	-1.360E+0
σ (Bias2)	---	4.382E-2	8.295E-2	9.960E-2	1.600E-1
Average+3σ (Bias2)	---	9.945E-2	-4.716E-2	-1.332E-1	-8.800E-1
Average-3σ (Bias2)	---	-1.635E-1	-5.448E-1	-7.308E-1	-1.840E+0

60 MeV proton / detailed results

9. TF1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



60 MeV proton / detailed results

TF1 . (µs) **Max = 25.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	2.24	2.20	2.16	2.28	2.28
N° 2 (Bias1)	2.44	2.40	2.40	2.32	2.20
N° 3 (Bias1)	2.48	2.52	2.40	2.44	2.48
N° 4 (Bias1)	2.40	2.28	2.32	2.36	2.44
N° 5 (Bias1)	2.36	2.32	2.44	2.28	2.08
N° 6 (Bias1)	2.40	2.32	2.40	2.32	2.16
N° 7 (Bias2)	2.28	2.32	2.36	2.28	2.20
N° 8 (Bias2)	2.64	2.80	2.72	2.76	2.56
N° 9 (Bias2)	2.52	2.48	2.44	2.56	2.20
N° 10 (Bias2)	2.04	2.12	2.16	2.16	2.12
N° 11 (Bias2)	2.36	2.36	2.36	2.36	2.04
N° 12 (OFF)	2.20	2.20	2.24	2.20	2.28
N° 13 (OFF)	2.48	2.56	2.40	2.44	2.80
N° 14 (OFF)	2.32	2.24	2.28	2.28	2.16
N° 15 (OFF)	2.44	2.44	2.44	2.36	2.08
N° 16 (OFF)	2.52	2.60	2.40	2.48	2.60

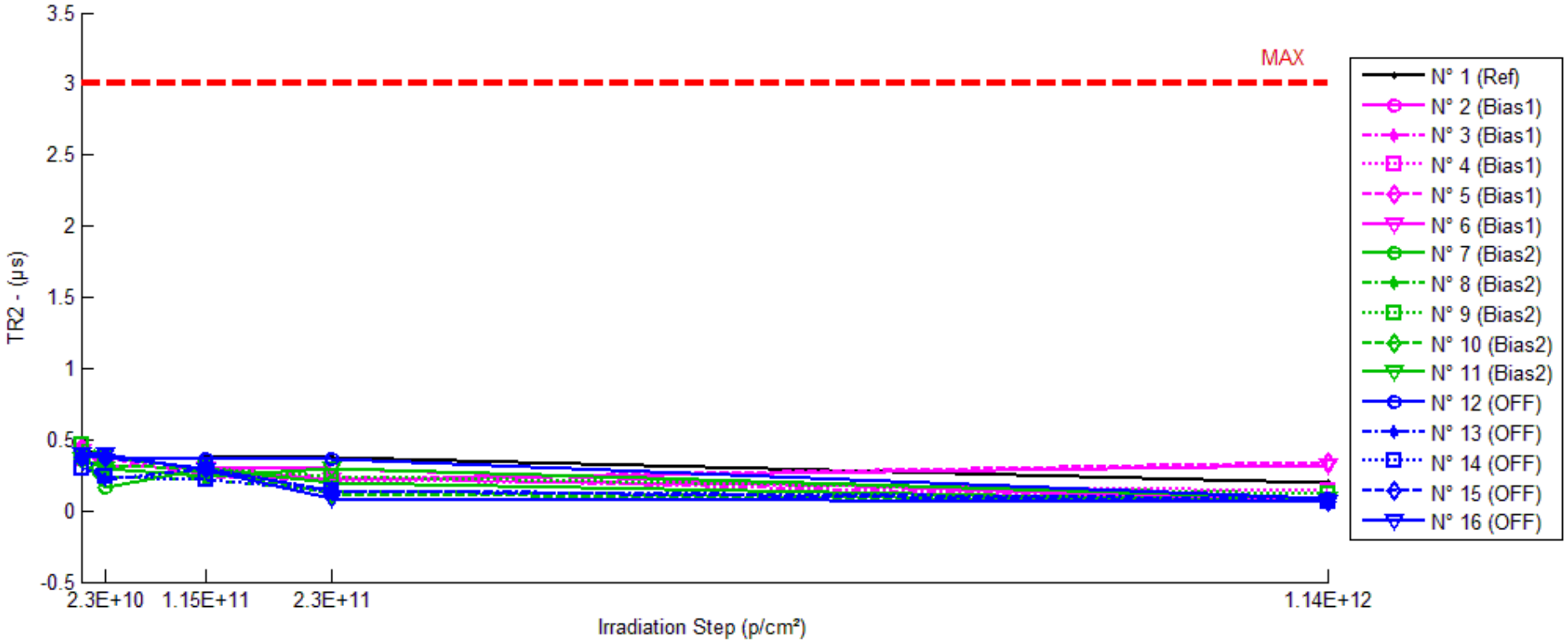
Delta [TF1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	-4.000E-2	-8.000E-2	4.000E-2	4.000E-2
N° 2 (Bias1)	---	-4.000E-2	-4.000E-2	-1.200E-1	-2.400E-1
N° 3 (Bias1)	---	4.000E-2	-8.000E-2	-4.000E-2	0.000E+0
N° 4 (Bias1)	---	-1.200E-1	-8.000E-2	-4.000E-2	4.000E-2
N° 5 (Bias1)	---	-4.000E-2	8.000E-2	-8.000E-2	-2.800E-1
N° 6 (Bias1)	---	-8.000E-2	0.000E+0	-8.000E-2	-2.400E-1
N° 7 (Bias2)	---	4.000E-2	8.000E-2	0.000E+0	-8.000E-2
N° 8 (Bias2)	---	1.600E-1	8.000E-2	1.200E-1	-8.000E-2
N° 9 (Bias2)	---	-4.000E-2	-8.000E-2	4.000E-2	-3.200E-1
N° 10 (Bias2)	---	8.000E-2	1.200E-1	1.200E-1	8.000E-2
N° 11 (Bias2)	---	0.000E+0	0.000E+0	0.000E+0	-3.200E-1
N° 12 (OFF)	---	0.000E+0	4.000E-2	0.000E+0	8.000E-2
N° 13 (OFF)	---	8.000E-2	-8.000E-2	-4.000E-2	3.200E-1
N° 14 (OFF)	---	-8.000E-2	-4.000E-2	-4.000E-2	-1.600E-1
N° 15 (OFF)	---	0.000E+0	0.000E+0	-8.000E-2	-3.600E-1
N° 16 (OFF)	---	8.000E-2	-1.200E-1	-4.000E-2	8.000E-2
Average (OFF)	---	-4.800E-2	-2.400E-2	-7.200E-2	-1.440E-1
σ (OFF)	---	5.933E-2	6.693E-2	3.347E-2	1.513E-1
Average+3σ (OFF)	---	1.300E-1	1.768E-1	2.840E-2	3.098E-1
Average-3σ (OFF)	---	-2.260E-1	-2.248E-1	-1.724E-1	-5.978E-1
Average (Bias1)	---	4.800E-2	4.000E-2	5.600E-2	-1.440E-1
σ (Bias1)	---	7.694E-2	8.000E-2	6.066E-2	1.734E-1
Average+3σ (Bias1)	---	2.788E-1	2.800E-1	2.380E-1	3.763E-1
Average-3σ (Bias1)	---	-1.828E-1	-2.000E-1	-1.260E-1	-6.643E-1
Average (Bias2)	---	1.600E-2	-4.000E-2	-4.000E-2	-8.000E-3
σ (Bias2)	---	6.693E-2	6.325E-2	2.828E-2	2.598E-1
Average+3σ (Bias2)	---	2.168E-1	1.497E-1	4.485E-2	7.715E-1
Average-3σ (Bias2)	---	-1.848E-1	-2.297E-1	-1.249E-1	-7.875E-1

60 MeV proton / detailed results

10.TR2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



60 MeV proton / detailed results

TR2 . (µs) **Max = 3.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	0.44	0.36	0.38	0.38	0.20
N° 2 (Bias1)	0.38	0.38	0.30	0.30	0.06
N° 3 (Bias1)	0.46	0.38	0.30	0.24	0.06
N° 4 (Bias1)	0.36	0.38	0.30	0.22	0.14
N° 5 (Bias1)	0.44	0.38	0.24	0.22	0.34
N° 6 (Bias1)	0.42	0.32	0.30	0.22	0.32
N° 7 (Bias2)	0.36	0.16	0.30	0.20	0.06
N° 8 (Bias2)	0.38	0.24	0.22	0.14	0.06
N° 9 (Bias2)	0.46	0.38	0.30	0.24	0.12
N° 10 (Bias2)	0.36	0.32	0.30	0.12	0.06
N° 11 (Bias2)	0.36	0.30	0.24	0.30	0.08
N° 12 (OFF)	0.38	0.38	0.36	0.36	0.08
N° 13 (OFF)	0.40	0.22	0.30	0.14	0.08
N° 14 (OFF)	0.30	0.24	0.22	0.14	0.06
N° 15 (OFF)	0.38	0.38	0.30	0.14	0.06
N° 16 (OFF)	0.40	0.40	0.28	0.08	0.06

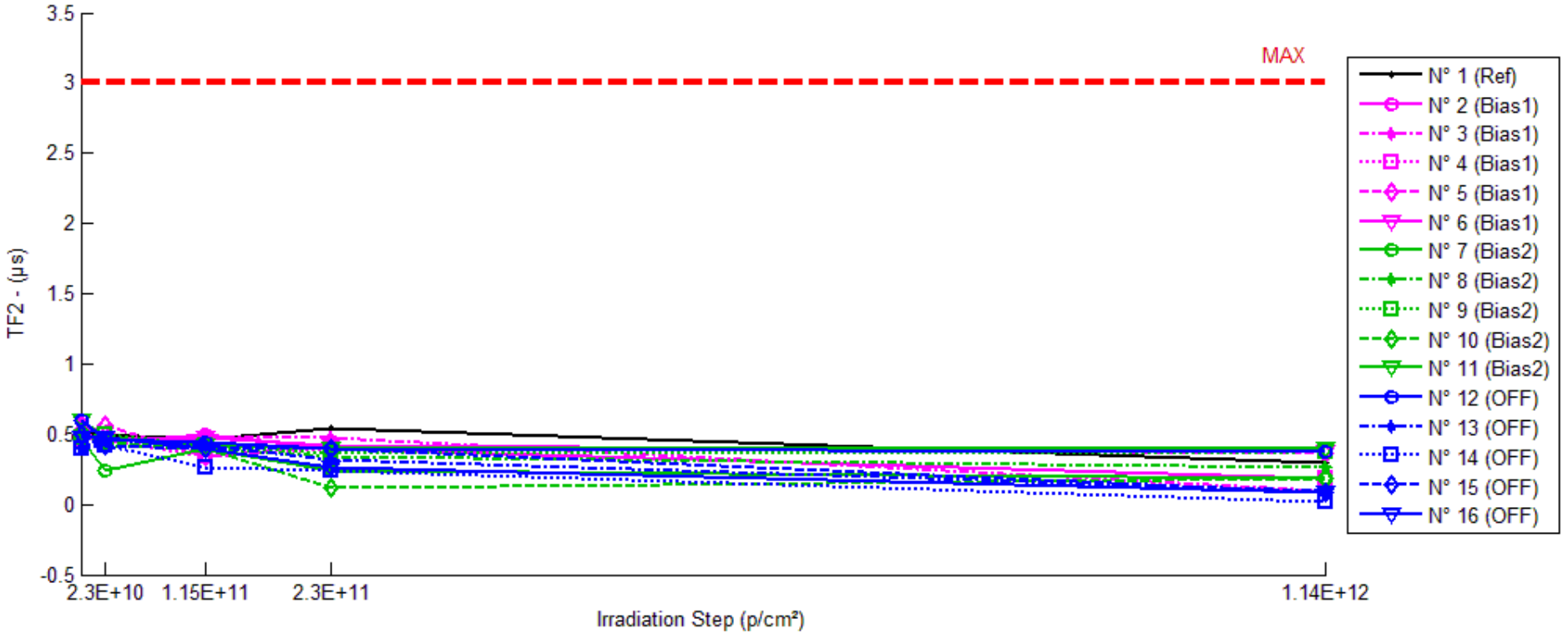
Delta [TR2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	-8.000E-2	-6.000E-2	-6.000E-2	-2.400E-1
N° 2 (Bias1)	---	0.000E+0	-8.000E-2	-8.000E-2	-3.200E-1
N° 3 (Bias1)	---	-8.000E-2	-1.600E-1	-2.200E-1	-4.000E-1
N° 4 (Bias1)	---	2.000E-2	-6.000E-2	-1.400E-1	-2.200E-1
N° 5 (Bias1)	---	-6.000E-2	-2.000E-1	-2.200E-1	-1.000E-1
N° 6 (Bias1)	---	-1.000E-1	-1.200E-1	-2.000E-1	-1.000E-1
N° 7 (Bias2)	---	-2.000E-1	-6.000E-2	-1.600E-1	-3.000E-1
N° 8 (Bias2)	---	-1.400E-1	-1.600E-1	-2.400E-1	-3.200E-1
N° 9 (Bias2)	---	-8.000E-2	-1.600E-1	-2.200E-1	-3.400E-1
N° 10 (Bias2)	---	-4.000E-2	-6.000E-2	-2.400E-1	-3.000E-1
N° 11 (Bias2)	---	-6.000E-2	-1.200E-1	-6.000E-2	-2.800E-1
N° 12 (OFF)	---	0.000E+0	-2.000E-2	-2.000E-2	-3.000E-1
N° 13 (OFF)	---	-1.800E-1	-1.000E-1	-2.600E-1	-3.200E-1
N° 14 (OFF)	---	-6.000E-2	-8.000E-2	-1.600E-1	-2.400E-1
N° 15 (OFF)	---	0.000E+0	-8.000E-2	-2.400E-1	-3.200E-1
N° 16 (OFF)	---	0.000E+0	-1.200E-1	-3.200E-1	-3.400E-1
Average (OFF)	---	-4.400E-2	-1.240E-1	-1.720E-1	-2.280E-1
σ (OFF)	---	5.177E-2	5.727E-2	6.099E-2	1.331E-1
Average+3σ (OFF)	---	1.113E-1	4.781E-2	1.098E-2	1.713E-1
Average-3σ (OFF)	---	-1.993E-1	-2.958E-1	-3.550E-1	-6.273E-1
Average (Bias1)	---	-1.040E-1	-1.120E-1	-1.840E-1	-3.080E-1
σ (Bias1)	---	6.542E-2	5.020E-2	7.668E-2	2.280E-2
Average+3σ (Bias1)	---	9.227E-2	3.860E-2	4.604E-2	-2.396E-1
Average-3σ (Bias1)	---	-3.003E-1	-2.626E-1	-4.140E-1	-3.764E-1
Average (Bias2)	---	-4.800E-2	-8.000E-2	-2.000E-1	-3.040E-1
σ (Bias2)	---	7.823E-2	3.742E-2	1.158E-1	3.847E-2
Average+3σ (Bias2)	---	1.867E-1	3.225E-2	1.473E-1	-1.886E-1
Average-3σ (Bias2)	---	-2.827E-1	-1.922E-1	-5.473E-1	-4.194E-1

60 MeV proton / detailed results

11.TF2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



60 MeV proton / detailed results

TF2 . (µs) **Max = 3.0**

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	0.52	0.50	0.46	0.54	0.30
N° 2 (Bias1)	0.52	0.44	0.50	0.40	0.18
N° 3 (Bias1)	0.60	0.46	0.48	0.48	0.10
N° 4 (Bias1)	0.46	0.46	0.34	0.40	0.18
N° 5 (Bias1)	0.50	0.56	0.34	0.42	0.36
N° 6 (Bias1)	0.48	0.46	0.48	0.42	0.38
N° 7 (Bias2)	0.46	0.24	0.40	0.24	0.18
N° 8 (Bias2)	0.52	0.42	0.40	0.34	0.26
N° 9 (Bias2)	0.48	0.50	0.42	0.36	0.38
N° 10 (Bias2)	0.52	0.44	0.40	0.12	0.18
N° 11 (Bias2)	0.60	0.48	0.42	0.40	0.40
N° 12 (OFF)	0.60	0.46	0.44	0.40	0.38
N° 13 (OFF)	0.40	0.46	0.42	0.32	0.10
N° 14 (OFF)	0.40	0.42	0.26	0.24	0.02
N° 15 (OFF)	0.50	0.42	0.40	0.40	0.08
N° 16 (OFF)	0.48	0.48	0.40	0.26	0.08

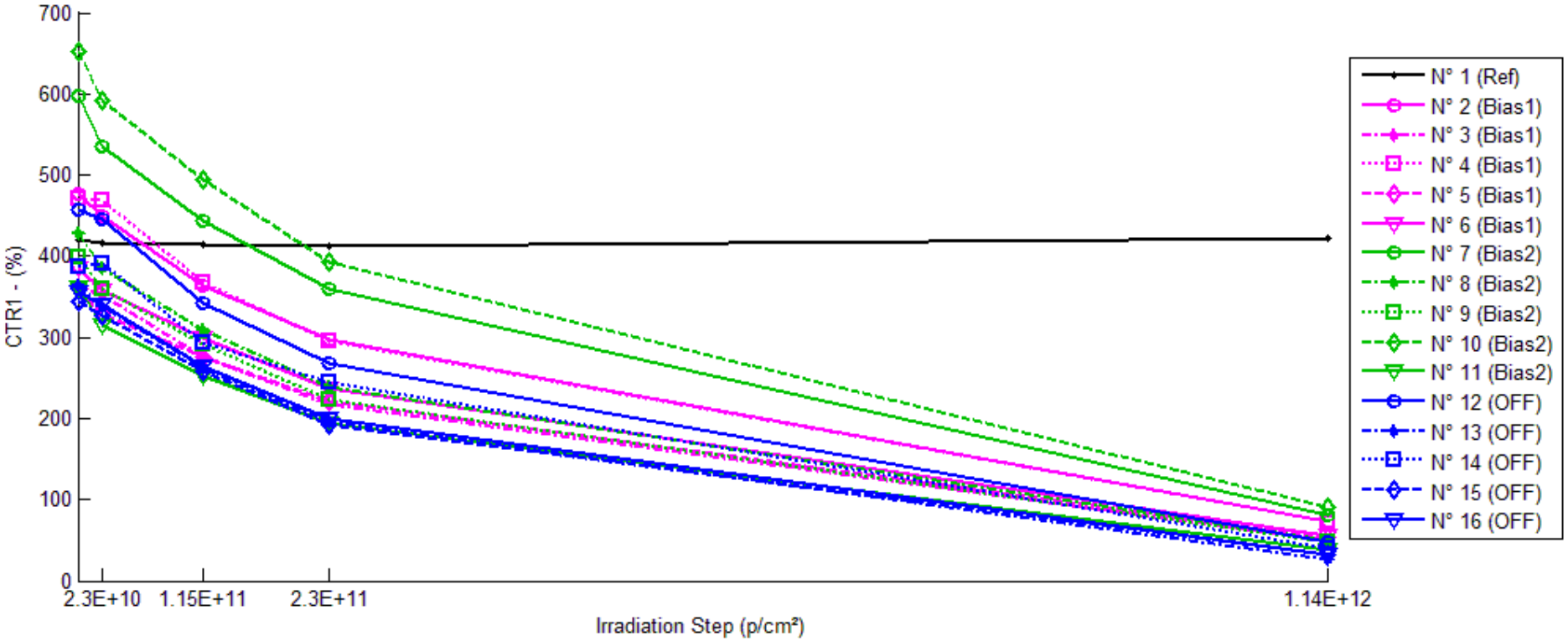
Delta [TF2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	-2.000E-2	-6.000E-2	2.000E-2	-2.200E-1
N° 2 (Bias1)	---	-8.000E-2	-2.000E-2	-1.200E-1	-3.400E-1
N° 3 (Bias1)	---	-1.400E-1	-1.200E-1	-1.200E-1	-5.000E-1
N° 4 (Bias1)	---	0.000E+0	-1.200E-1	-6.000E-2	-2.800E-1
N° 5 (Bias1)	---	6.000E-2	-1.600E-1	-8.000E-2	-1.400E-1
N° 6 (Bias1)	---	-2.000E-2	0.000E+0	-6.000E-2	-1.000E-1
N° 7 (Bias2)	---	-2.200E-1	-6.000E-2	-2.200E-1	-2.800E-1
N° 8 (Bias2)	---	-1.000E-1	-1.200E-1	-1.800E-1	-2.600E-1
N° 9 (Bias2)	---	2.000E-2	-6.000E-2	-1.200E-1	-1.000E-1
N° 10 (Bias2)	---	-8.000E-2	-1.200E-1	-4.000E-1	-3.400E-1
N° 11 (Bias2)	---	-1.200E-1	-1.800E-1	-2.000E-1	-2.000E-1
N° 12 (OFF)	---	-1.400E-1	-1.600E-1	-2.000E-1	-2.200E-1
N° 13 (OFF)	---	6.000E-2	2.000E-2	-8.000E-2	-3.000E-1
N° 14 (OFF)	---	2.000E-2	-1.400E-1	-1.600E-1	-3.800E-1
N° 15 (OFF)	---	-8.000E-2	-1.000E-1	-1.000E-1	-4.200E-1
N° 16 (OFF)	---	0.000E+0	-8.000E-2	-2.200E-1	-4.000E-1
Average (OFF)	---	-3.600E-2	-8.400E-2	-8.800E-2	-2.720E-1
σ (OFF)	---	7.668E-2	6.986E-2	3.033E-2	1.610E-1
Average+3σ (OFF)	---	1.940E-1	1.256E-1	2.995E-3	2.110E-1
Average-3σ (OFF)	---	-2.660E-1	-2.936E-1	-1.790E-1	-7.550E-1
Average (Bias1)	---	-1.000E-1	-1.080E-1	-2.240E-1	-2.360E-1
σ (Bias1)	---	8.602E-2	5.020E-2	1.053E-1	9.099E-2
Average+3σ (Bias1)	---	1.581E-1	4.260E-2	9.178E-2	3.698E-2
Average-3σ (Bias1)	---	-3.581E-1	-2.586E-1	-5.398E-1	-5.090E-1
Average (Bias2)	---	-2.800E-2	-9.200E-2	-1.520E-1	-3.440E-1
σ (Bias2)	---	8.075E-2	7.014E-2	6.099E-2	8.295E-2
Average+3σ (Bias2)	---	2.142E-1	1.184E-1	3.098E-2	-9.516E-2
Average-3σ (Bias2)	---	-2.702E-1	-3.024E-1	-3.350E-1	-5.928E-1

60 MeV proton / detailed results

12.CTR1

Ta=25°C; Vce=5V; If=1mA



60 MeV proton / detailed results

CTR1 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	420.81	416.77	413.47	411.51	421.29
N° 2 (Bias1)	477.01	450.38	364.07	297.45	72.79
N° 3 (Bias1)	362.16	352.56	275.53	218.17	50.25
N° 4 (Bias1)	470.94	468.28	367.58	295.70	73.43
N° 5 (Bias1)	359.04	328.14	276.05	222.08	53.20
N° 6 (Bias1)	385.73	358.15	299.34	237.14	55.60
N° 7 (Bias2)	596.94	535.06	442.63	359.66	80.36
N° 8 (Bias2)	427.42	384.93	309.20	238.16	48.75
N° 9 (Bias2)	398.90	359.74	292.20	223.01	48.27
N° 10 (Bias2)	652.77	592.64	495.03	393.07	90.61
N° 11 (Bias2)	361.07	315.31	253.22	194.38	37.28
N° 12 (OFF)	456.53	445.77	342.38	268.84	47.78
N° 13 (OFF)	363.15	339.19	261.59	195.14	26.86
N° 14 (OFF)	386.45	390.46	293.18	244.27	39.36
N° 15 (OFF)	343.76	326.21	258.83	191.36	32.64
N° 16 (OFF)	356.50	340.31	264.61	200.09	31.83

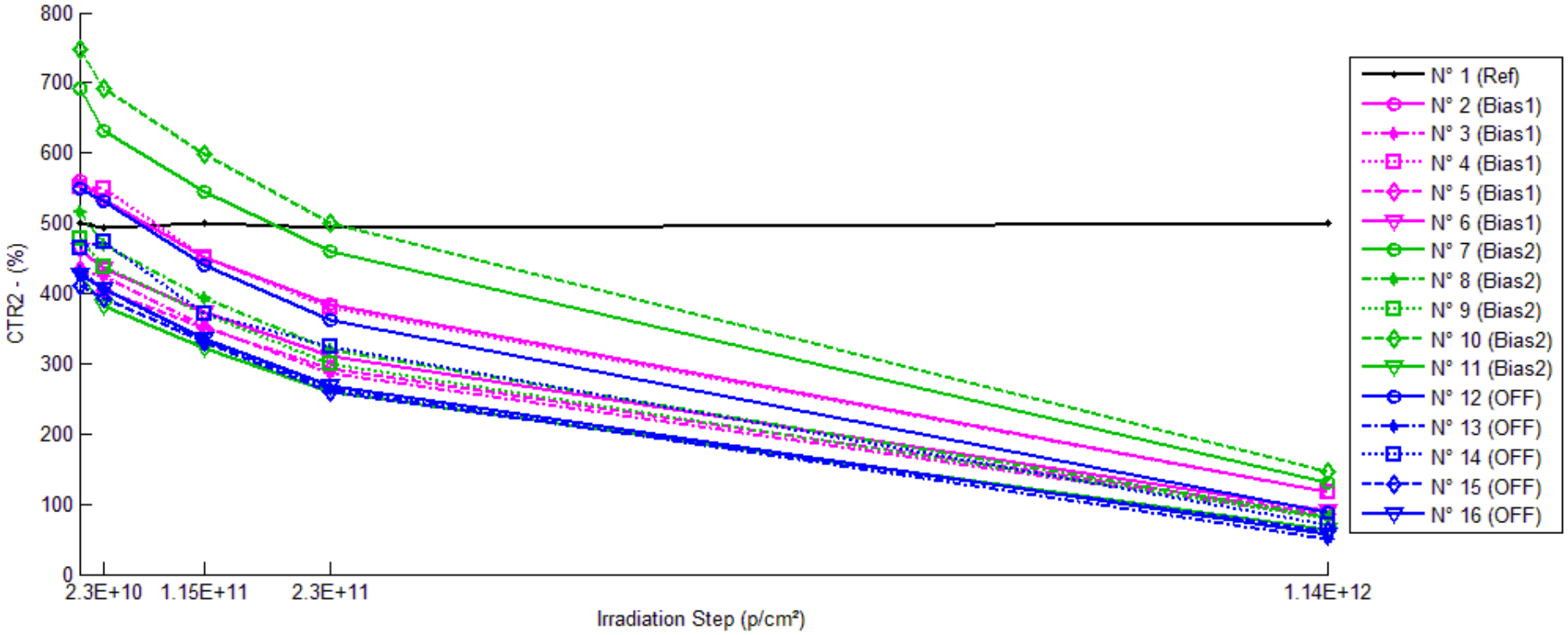
1/Delta [CTR1]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	2.299E-5	4.219E-5	5.368E-5	-2.732E-6
N° 2 (Bias1)	---	1.240E-4	6.503E-4	1.266E-3	1.164E-2
N° 3 (Bias1)	---	7.519E-5	8.682E-4	1.822E-3	1.714E-2
N° 4 (Bias1)	---	1.207E-5	5.971E-4	1.258E-3	1.150E-2
N° 5 (Bias1)	---	2.623E-4	8.374E-4	1.718E-3	1.601E-2
N° 6 (Bias1)	---	1.997E-4	7.482E-4	1.624E-3	1.539E-2
N° 7 (Bias2)	---	1.937E-4	5.840E-4	1.105E-3	1.077E-2
N° 8 (Bias2)	---	2.582E-4	8.946E-4	1.859E-3	1.817E-2
N° 9 (Bias2)	---	2.729E-4	9.155E-4	1.977E-3	1.821E-2
N° 10 (Bias2)	---	1.554E-4	4.882E-4	1.012E-3	9.504E-3
N° 11 (Bias2)	---	4.019E-4	1.180E-3	2.375E-3	2.405E-2
N° 12 (OFF)	---	5.288E-5	7.303E-4	1.529E-3	1.874E-2
N° 13 (OFF)	---	1.945E-4	1.069E-3	2.371E-3	3.447E-2
N° 14 (OFF)	---	-2.663E-5	8.232E-4	1.506E-3	2.282E-2
N° 15 (OFF)	---	1.565E-4	9.546E-4	2.317E-3	2.773E-2
N° 16 (OFF)	---	1.335E-4	9.741E-4	2.193E-3	2.861E-2
Average (OFF)	---	1.346E-4	7.402E-4	1.538E-3	1.434E-2
σ (OFF)	---	9.898E-5	1.167E-4	2.613E-4	2.604E-3
Average+3σ (OFF)	---	4.316E-4	1.090E-3	2.322E-3	2.215E-2
Average-3σ (OFF)	---	-1.623E-4	3.903E-4	7.539E-4	6.525E-3
Average (Bias1)	---	2.564E-4	8.124E-4	1.666E-3	1.614E-2
σ (Bias1)	---	9.430E-5	2.782E-4	5.871E-4	5.999E-3
Average+3σ (Bias1)	---	5.393E-4	1.647E-3	3.427E-3	3.414E-2
Average-3σ (Bias1)	---	-2.644E-5	-2.217E-5	-9.559E-5	-1.854E-3
Average (Bias2)	---	1.022E-4	9.102E-4	1.983E-3	2.648E-2
σ (Bias2)	---	8.871E-5	1.334E-4	4.299E-4	5.986E-3
Average+3σ (Bias2)	---	3.683E-4	1.311E-3	3.273E-3	4.443E-2
Average-3σ (Bias2)	---	-1.640E-4	5.099E-4	6.936E-4	8.518E-3

60 MeV proton / detailed results

13.CTR2

Ta=25°C; Vce=5V; If=2mA



60 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	499.63	494.42	499.71	494.42	499.54
N° 2 (Bias1)	560.99	534.25	451.79	385.37	117.57
N° 3 (Bias1)	433.99	424.78	353.30	287.41	80.72
N° 4 (Bias1)	551.21	550.34	452.06	380.57	117.83
N° 5 (Bias1)	432.65	404.87	350.61	292.89	84.80
N° 6 (Bias1)	462.29	436.05	373.73	310.77	89.24
N° 7 (Bias2)	692.46	632.76	545.84	460.54	130.70
N° 8 (Bias2)	514.77	468.54	394.36	319.93	81.29
N° 9 (Bias2)	478.87	437.05	371.03	299.83	79.99
N° 10 (Bias2)	747.81	691.07	599.38	501.10	147.00
N° 11 (Bias2)	427.49	382.69	322.10	260.35	62.67
N° 12 (OFF)	548.87	532.34	439.87	362.74	86.96
N° 13 (OFF)	430.45	406.91	332.46	263.86	50.65
N° 14 (OFF)	463.77	472.60	370.26	324.36	70.46
N° 15 (OFF)	411.53	392.85	331.84	259.44	61.54
N° 16 (OFF)	426.55	407.21	334.70	268.52	56.78

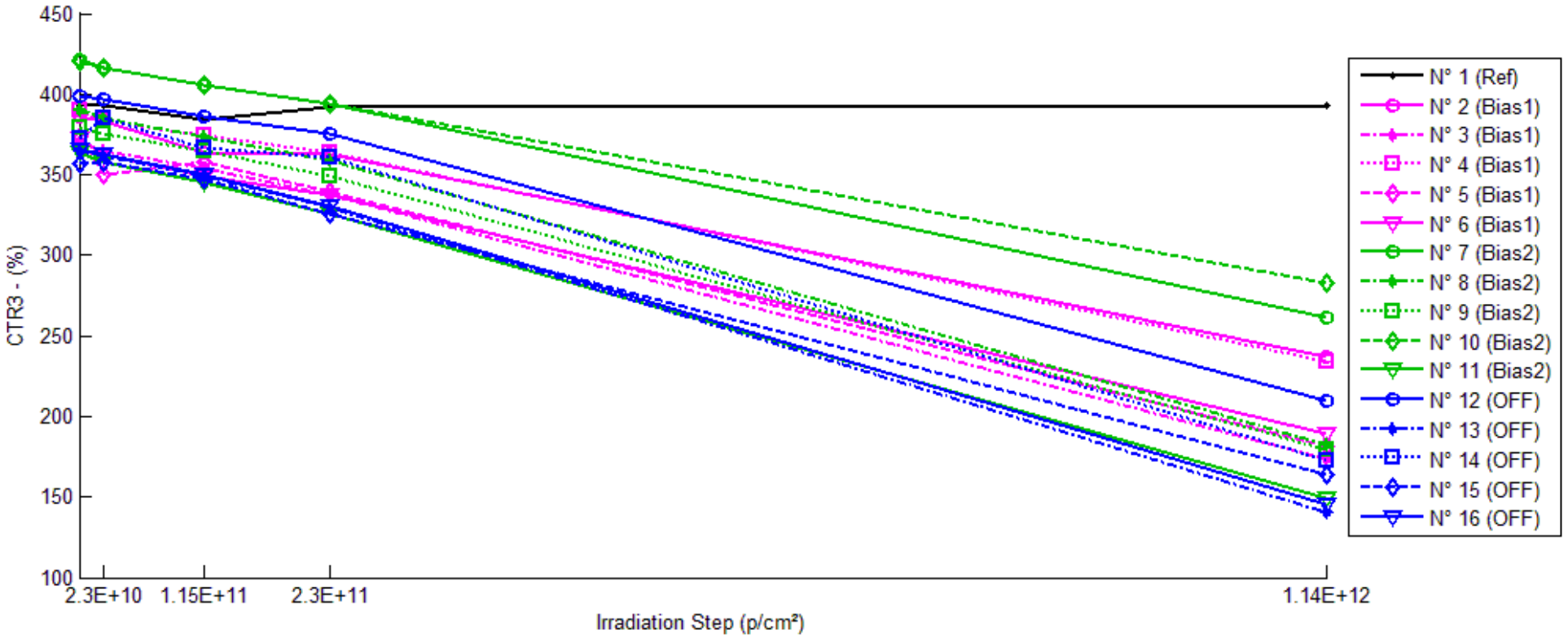
1/Delta [CTR2]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	2.108E-5	-3.168E-7	2.109E-5	3.490E-7
N° 2 (Bias1)	---	8.923E-5	4.308E-4	8.123E-4	6.723E-3
N° 3 (Bias1)	---	4.996E-5	5.262E-4	1.175E-3	1.008E-2
N° 4 (Bias1)	---	2.848E-6	3.979E-4	8.134E-4	6.672E-3
N° 5 (Bias1)	---	1.586E-4	5.408E-4	1.103E-3	9.482E-3
N° 6 (Bias1)	---	1.302E-4	5.126E-4	1.055E-3	9.042E-3
N° 7 (Bias2)	---	1.363E-4	3.879E-4	7.273E-4	6.207E-3
N° 8 (Bias2)	---	1.916E-4	5.932E-4	1.183E-3	1.036E-2
N° 9 (Bias2)	---	1.998E-4	6.069E-4	1.247E-3	1.041E-2
N° 10 (Bias2)	---	1.098E-4	3.312E-4	6.584E-4	5.465E-3
N° 11 (Bias2)	---	2.738E-4	7.654E-4	1.502E-3	1.362E-2
N° 12 (OFF)	---	5.658E-5	4.515E-4	9.349E-4	9.678E-3
N° 13 (OFF)	---	1.344E-4	6.848E-4	1.467E-3	1.742E-2
N° 14 (OFF)	---	-4.031E-5	5.446E-4	9.267E-4	1.204E-2
N° 15 (OFF)	---	1.155E-4	5.835E-4	1.424E-3	1.382E-2
N° 16 (OFF)	---	1.114E-4	6.433E-4	1.380E-3	1.527E-2
Average (OFF)	---	8.616E-5	4.817E-4	9.917E-4	8.401E-3
σ (OFF)	---	6.213E-5	6.332E-5	1.688E-4	1.598E-3
Average+3σ (OFF)	---	2.726E-4	6.716E-4	1.498E-3	1.319E-2
Average-3σ (OFF)	---	-1.002E-4	2.917E-4	4.853E-4	3.607E-3
Average (Bias1)	---	1.823E-4	5.369E-4	1.063E-3	9.212E-3
σ (Bias1)	---	6.354E-5	1.766E-4	3.596E-4	3.362E-3
Average+3σ (Bias1)	---	3.729E-4	1.067E-3	2.142E-3	1.930E-2
Average-3σ (Bias1)	---	-8.346E-6	6.993E-6	-1.523E-5	-8.752E-4
Average (Bias2)	---	7.551E-5	5.815E-4	1.226E-3	1.364E-2
σ (Bias2)	---	7.094E-5	9.051E-5	2.717E-4	2.968E-3
Average+3σ (Bias2)	---	2.883E-4	8.531E-4	2.042E-3	2.255E-2
Average-3σ (Bias2)	---	-1.373E-4	3.100E-4	4.114E-4	4.740E-3

60 MeV proton / detailed results

14.CTR3

Ta=25°C; Vce=5V; If=10mA



60 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	393.17	392.56	384.30	391.55	393.37
N° 2 (Bias1)	386.54	383.39	363.87	362.45	237.25
N° 3 (Bias1)	369.50	364.96	353.68	337.34	173.91
N° 4 (Bias1)	389.63	383.64	374.83	363.97	234.18
N° 5 (Bias1)	373.16	350.07	357.80	338.98	181.63
N° 6 (Bias1)	372.22	363.15	348.79	337.64	188.79
N° 7 (Bias2)	421.55	416.25	405.55	394.10	261.26
N° 8 (Bias2)	390.02	385.50	373.71	358.61	182.77
N° 9 (Bias2)	379.58	375.41	364.21	348.75	179.54
N° 10 (Bias2)	420.18	416.47	406.04	394.18	282.77
N° 11 (Bias2)	363.51	357.92	344.81	325.30	149.19
N° 12 (OFF)	399.15	397.17	386.34	375.17	209.63
N° 13 (OFF)	365.09	362.22	348.81	329.41	140.41
N° 14 (OFF)	372.74	385.27	366.96	360.81	172.42
N° 15 (OFF)	357.31	357.50	347.51	326.17	163.41
N° 16 (OFF)	365.23	362.78	349.73	330.62	145.21

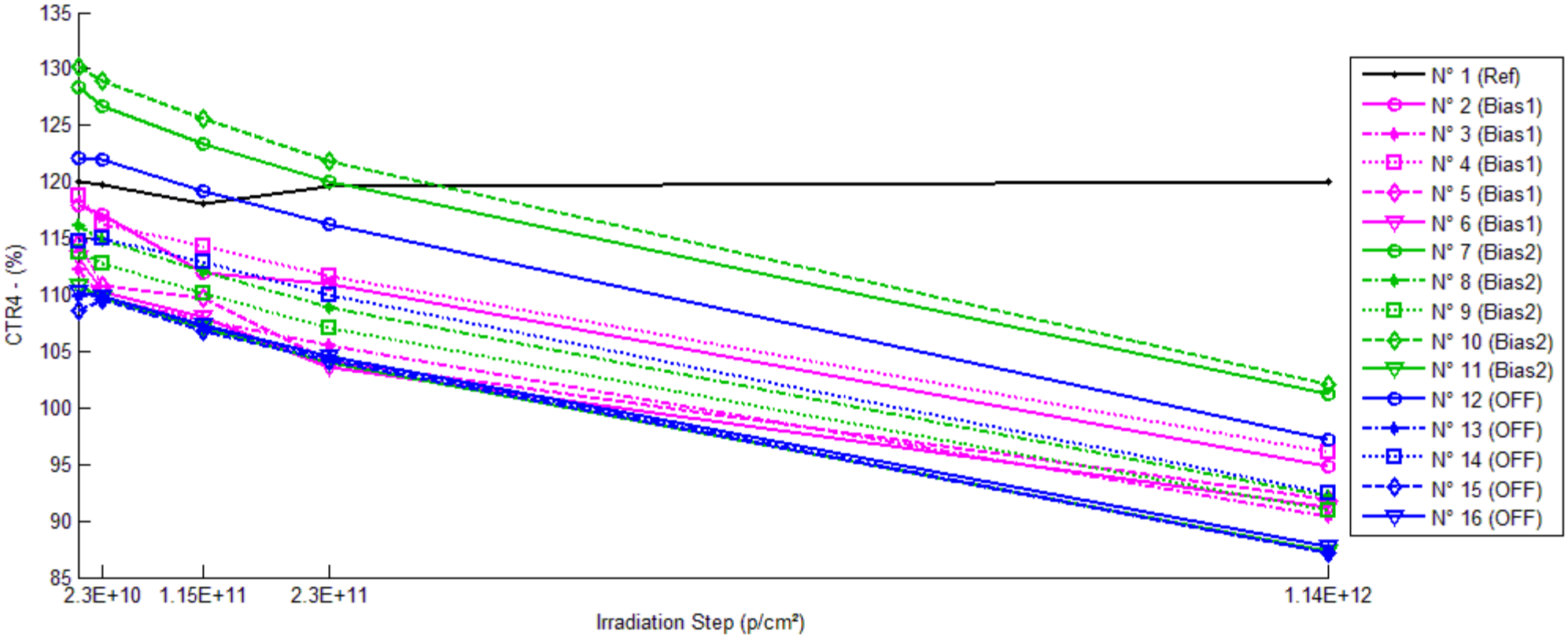
1/Delta [CTR3]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	3.962E-6	5.866E-5	1.051E-5	-1.292E-6
N° 2 (Bias1)	---	2.124E-5	1.612E-4	1.719E-4	1.628E-3
N° 3 (Bias1)	---	3.370E-5	1.211E-4	2.580E-4	3.044E-3
N° 4 (Bias1)	---	4.011E-5	1.013E-4	1.809E-4	1.704E-3
N° 5 (Bias1)	---	1.768E-4	1.151E-4	2.702E-4	2.826E-3
N° 6 (Bias1)	---	6.707E-5	1.805E-4	2.751E-4	2.610E-3
N° 7 (Bias2)	---	3.019E-5	9.360E-5	1.652E-4	1.455E-3
N° 8 (Bias2)	---	3.011E-5	1.119E-4	2.246E-4	2.908E-3
N° 9 (Bias2)	---	2.931E-5	1.112E-4	2.329E-4	2.935E-3
N° 10 (Bias2)	---	2.116E-5	8.285E-5	1.569E-4	1.157E-3
N° 11 (Bias2)	---	4.293E-5	1.492E-4	3.231E-4	3.952E-3
N° 12 (OFF)	---	1.249E-5	8.305E-5	1.601E-4	2.265E-3
N° 13 (OFF)	---	2.168E-5	1.278E-4	2.967E-4	4.383E-3
N° 14 (OFF)	---	-8.720E-5	4.229E-5	8.875E-5	3.117E-3
N° 15 (OFF)	---	-1.507E-6	7.888E-5	2.672E-4	3.321E-3
N° 16 (OFF)	---	1.850E-5	1.214E-4	2.866E-4	4.148E-3
Average (OFF)	---	6.778E-5	1.358E-4	2.312E-4	2.362E-3
σ (OFF)	---	6.320E-5	3.346E-5	5.054E-5	6.546E-4
Average+3σ (OFF)	---	2.574E-4	2.362E-4	3.829E-4	4.326E-3
Average-3σ (OFF)	---	-1.218E-4	3.545E-5	7.962E-5	3.985E-4
Average (Bias1)	---	3.074E-5	1.097E-4	2.205E-4	2.481E-3
σ (Bias1)	---	7.796E-6	2.523E-5	6.669E-5	1.157E-3
Average+3σ (Bias1)	---	5.413E-5	1.854E-4	4.206E-4	5.953E-3
Average-3σ (Bias1)	---	7.351E-6	3.404E-5	2.048E-5	-9.906E-4
Average (Bias2)	---	-7.206E-6	9.068E-5	2.199E-4	3.447E-3
σ (Bias2)	---	4.559E-5	3.486E-5	9.132E-5	8.500E-4
Average+3σ (Bias2)	---	1.296E-4	1.953E-4	4.938E-4	5.997E-3

60 MeV proton / detailed results

15.CTR4

Ta=25°C; Vce=5V; If=50mA



60 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	119.98	119.77	118.05	119.63	120.03
N° 2 (Bias1)	117.95	117.10	111.93	110.97	94.78
N° 3 (Bias1)	112.29	109.71	107.73	105.58	90.41
N° 4 (Bias1)	118.81	116.31	114.36	111.68	96.11
N° 5 (Bias1)	114.54	110.79	109.77	104.12	91.96
N° 6 (Bias1)	113.38	110.32	108.10	103.63	91.25
N° 7 (Bias2)	128.34	126.66	123.44	119.96	101.23
N° 8 (Bias2)	116.07	114.91	112.04	108.94	92.15
N° 9 (Bias2)	113.76	112.78	110.13	107.06	90.97
N° 10 (Bias2)	130.23	128.95	125.61	121.88	102.07
N° 11 (Bias2)	110.77	109.76	107.06	104.05	87.34
N° 12 (OFF)	122.18	122.01	119.16	116.24	97.25
N° 13 (OFF)	109.92	109.91	107.28	104.41	87.18
N° 14 (OFF)	114.77	115.06	112.91	110.00	92.45
N° 15 (OFF)	108.66	109.53	106.85	104.21	87.17
N° 16 (OFF)	110.29	109.80	107.33	104.56	87.78

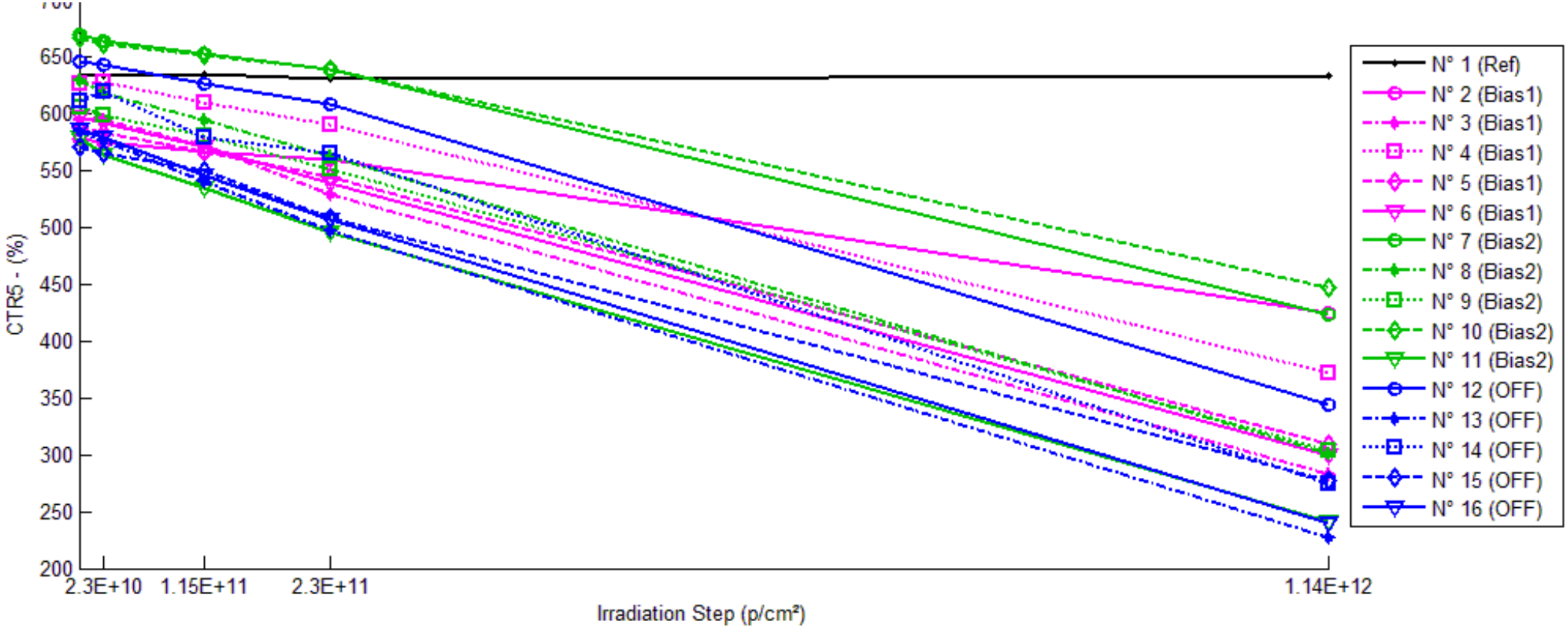
1/Delta [CTR4]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	1.502E-5	1.365E-4	2.491E-5	-3.430E-6
N° 2 (Bias1)	---	6.205E-5	4.562E-4	5.335E-4	2.073E-3
N° 3 (Bias1)	---	2.096E-4	3.771E-4	5.659E-4	2.155E-3
N° 4 (Bias1)	---	1.806E-4	3.273E-4	5.376E-4	1.988E-3
N° 5 (Bias1)	---	2.953E-4	3.792E-4	8.734E-4	2.144E-3
N° 6 (Bias1)	---	2.446E-4	4.313E-4	8.301E-4	2.139E-3
N° 7 (Bias2)	---	1.031E-4	3.092E-4	5.441E-4	2.086E-3
N° 8 (Bias2)	---	8.674E-5	3.094E-4	5.633E-4	2.236E-3
N° 9 (Bias2)	---	7.608E-5	2.898E-4	5.496E-4	2.202E-3
N° 10 (Bias2)	---	7.622E-5	2.822E-4	5.257E-4	2.118E-3
N° 11 (Bias2)	---	8.278E-5	3.125E-4	5.825E-4	2.422E-3
N° 12 (OFF)	---	1.129E-5	2.073E-4	4.179E-4	2.097E-3
N° 13 (OFF)	---	9.601E-7	2.240E-4	4.806E-4	2.373E-3
N° 14 (OFF)	---	-2.145E-5	1.440E-4	3.784E-4	2.104E-3
N° 15 (OFF)	---	-7.325E-5	1.559E-4	3.929E-4	2.269E-3
N° 16 (OFF)	---	3.997E-5	2.498E-4	4.966E-4	2.325E-3
Average (OFF)	---	1.984E-4	3.942E-4	6.681E-4	2.100E-3
σ (OFF)	---	8.739E-5	5.054E-5	1.688E-4	7.038E-5
Average+3σ (OFF)	---	4.606E-4	5.459E-4	1.175E-3	2.311E-3
Average-3σ (OFF)	---	-6.377E-5	2.426E-4	1.616E-4	1.889E-3
Average (Bias1)	---	8.499E-5	3.006E-4	5.530E-4	2.213E-3
σ (Bias1)	---	1.111E-5	1.369E-5	2.127E-5	1.317E-4
Average+3σ (Bias1)	---	1.183E-4	3.417E-4	6.168E-4	2.608E-3
Average-3σ (Bias1)	---	5.167E-5	2.595E-4	4.892E-4	1.818E-3
Average (Bias2)	---	-8.496E-6	1.962E-4	4.333E-4	2.234E-3
σ (Bias2)	---	4.240E-5	4.507E-5	5.275E-5	1.267E-4
Average+3σ (Bias2)	---	1.187E-4	3.314E-4	5.915E-4	2.614E-3
Average-3σ (Bias2)	---	-1.357E-4	6.097E-5	2.750E-4	1.854E-3

60 MeV proton / detailed results

16.CTR5

Ta=25°C; Vce=30V; If=10mA



60 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	633.53	633.48	635.21	631.39	633.41
N° 2 (Bias1)	577.66	575.16	566.94	559.70	424.64
N° 3 (Bias1)	595.38	595.45	572.04	529.63	282.21
N° 4 (Bias1)	626.26	628.48	610.40	590.29	371.54
N° 5 (Bias1)	588.39	583.75	567.40	544.24	309.36
N° 6 (Bias1)	597.16	592.39	570.91	539.43	300.15
N° 7 (Bias2)	670.01	664.28	652.82	639.09	423.76
N° 8 (Bias2)	629.12	619.02	595.51	562.61	301.58
N° 9 (Bias2)	606.53	598.84	580.33	551.69	303.24
N° 10 (Bias2)	667.47	662.33	652.20	639.93	446.86
N° 11 (Bias2)	580.10	564.60	534.46	495.55	240.75
N° 12 (OFF)	646.41	643.20	627.43	609.18	344.27
N° 13 (OFF)	585.52	576.74	540.82	497.68	226.92
N° 14 (OFF)	612.22	619.66	579.40	566.10	274.83
N° 15 (OFF)	570.53	565.40	549.92	508.59	277.63
N° 16 (OFF)	586.86	579.86	546.01	506.97	239.49

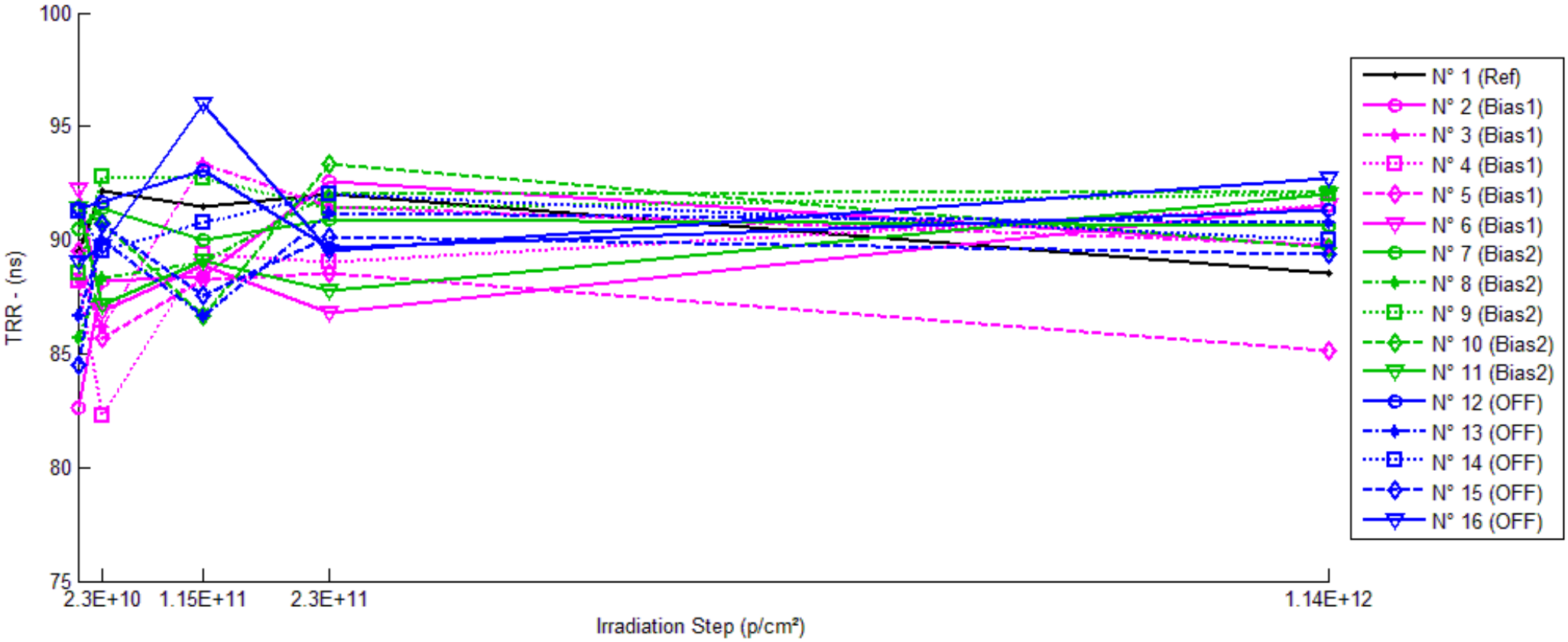
1/Delta [CTR5]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	1.415E-7	-4.168E-6	5.358E-6	3.050E-7
N° 2 (Bias1)	---	7.529E-6	3.274E-5	5.556E-5	6.238E-4
N° 3 (Bias1)	---	-1.845E-7	6.851E-5	2.085E-4	1.864E-3
N° 4 (Bias1)	---	-5.658E-6	4.149E-5	9.729E-5	1.095E-3
N° 5 (Bias1)	---	1.352E-5	6.288E-5	1.379E-4	1.533E-3
N° 6 (Bias1)	---	1.348E-5	7.700E-5	1.792E-4	1.657E-3
N° 7 (Bias2)	---	1.289E-5	3.932E-5	7.221E-5	8.673E-4
N° 8 (Bias2)	---	2.594E-5	8.971E-5	1.879E-4	1.726E-3
N° 9 (Bias2)	---	2.117E-5	7.444E-5	1.639E-4	1.649E-3
N° 10 (Bias2)	---	1.163E-5	3.509E-5	6.449E-5	7.396E-4
N° 11 (Bias2)	---	4.733E-5	1.472E-4	2.941E-4	2.430E-3
N° 12 (OFF)	---	7.720E-6	4.680E-5	9.455E-5	1.358E-3
N° 13 (OFF)	---	2.600E-5	1.411E-4	3.014E-4	2.699E-3
N° 14 (OFF)	---	-1.963E-5	9.252E-5	1.331E-4	2.005E-3
N° 15 (OFF)	---	1.589E-5	6.567E-5	2.135E-4	1.849E-3
N° 16 (OFF)	---	2.057E-5	1.275E-4	2.685E-4	2.472E-3
Average (OFF)	---	5.737E-6	5.652E-5	1.357E-4	1.354E-3
σ (OFF)	---	8.494E-6	1.868E-5	6.144E-5	4.960E-4
Average+3σ (OFF)	---	3.122E-5	1.126E-4	3.200E-4	2.843E-3
Average-3σ (OFF)	---	-1.975E-5	4.912E-7	-4.863E-5	-1.336E-4
Average (Bias1)	---	2.379E-5	7.715E-5	1.565E-4	1.482E-3
σ (Bias1)	---	1.442E-5	4.548E-5	9.428E-5	6.919E-4
Average+3σ (Bias1)	---	6.706E-5	2.136E-4	4.394E-4	3.558E-3
Average-3σ (Bias1)	---	-1.948E-5	-5.929E-5	-1.263E-4	-5.933E-4
Average (Bias2)	---	1.011E-5	9.473E-5	2.022E-4	2.077E-3
σ (Bias2)	---	1.793E-5	3.992E-5	8.767E-5	5.284E-4
Average+3σ (Bias2)	---	6.389E-5	2.145E-4	4.652E-4	3.662E-3
Average-3σ (Bias2)	---	-4.367E-5	-2.504E-5	-6.080E-5	4.912E-4

60 MeV proton / detailed results

17.TRR

Ta=25°C; If = 5mA; RL = 100 Ohms; Irec = 10% Irm



60 MeV proton / detailed results

TRR . (ns)

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	89.50	92.18	91.48	92.00	88.52
N° 2 (Bias1)	82.64	88.20	88.40	92.56	89.74
N° 3 (Bias1)	88.24	86.19	93.33	91.48	89.78
N° 4 (Bias1)	88.20	82.27	89.36	89.04	91.55
N° 5 (Bias1)	89.50	85.71	88.29	88.55	85.15
N° 6 (Bias1)	92.22	86.88	88.89	86.81	91.54
N° 7 (Bias2)	90.46	91.39	90.00	90.91	90.66
N° 8 (Bias2)	85.71	88.33	89.01	92.00	92.20
N° 9 (Bias2)	88.54	92.81	92.75	91.39	92.00
N° 10 (Bias2)	91.39	90.78	86.67	93.37	89.68
N° 11 (Bias2)	91.39	87.12	89.11	87.78	92.00
N° 12 (OFF)	91.39	91.67	93.07	89.63	91.36
N° 13 (OFF)	86.67	90.00	86.67	91.16	90.78
N° 14 (OFF)	91.23	89.55	90.78	92.00	90.00
N° 15 (OFF)	84.51	90.72	87.60	90.12	89.36
N° 16 (OFF)	89.05	89.70	96.00	89.50	92.75

Delta [TRR]

	0.p/cm²	2.3E10.p/cm²	1.15E11.p/cm²	2.3E11.p/cm²	1.140E12.p/cm²
N° 1 (Ref)	---	2.678E+0	1.973E+0	2.497E+0	-9.782E-1
N° 2 (Bias1)	---	5.554E+0	5.753E+0	9.917E+0	7.091E+0
N° 3 (Bias1)	---	-2.047E+0	5.098E+0	3.245E+0	1.540E+0
N° 4 (Bias1)	---	-5.929E+0	1.163E+0	8.378E-1	3.351E+0
N° 5 (Bias1)	---	-3.788E+0	-1.214E+0	-9.531E-1	-4.354E+0
N° 6 (Bias1)	---	-5.344E+0	-3.333E+0	-5.409E+0	-6.799E-1
N° 7 (Bias2)	---	9.297E-1	-4.564E-1	4.527E-1	1.993E-1
N° 8 (Bias2)	---	2.619E+0	3.297E+0	6.286E+0	6.484E+0
N° 9 (Bias2)	---	4.265E+0	4.200E+0	2.841E+0	3.455E+0
N° 10 (Bias2)	---	-6.018E-1	-4.719E+0	1.980E+0	-1.706E+0
N° 11 (Bias2)	---	-4.270E+0	-2.277E+0	-3.606E+0	6.139E-1
N° 12 (OFF)	---	2.805E-1	1.683E+0	-1.760E+0	-2.812E-2
N° 13 (OFF)	---	3.333E+0	0.000E+0	4.490E+0	4.118E+0
N° 14 (OFF)	---	-1.676E+0	-4.438E-1	7.719E-1	-1.228E+0
N° 15 (OFF)	---	6.215E+0	3.096E+0	5.609E+0	4.855E+0
N° 16 (OFF)	---	6.551E-1	6.954E+0	4.568E-1	3.699E+0
Average (OFF)	---	-2.311E+0	1.493E+0	1.527E+0	1.390E+0
σ (OFF)	---	4.648E+0	3.933E+0	5.659E+0	4.291E+0
Average+3σ (OFF)	---	1.163E+1	1.329E+1	1.850E+1	1.426E+1
Average-3σ (OFF)	---	-1.625E+1	-1.031E+1	-1.545E+1	-1.148E+1
Average (Bias1)	---	5.885E-1	8.756E-3	1.591E+0	1.809E+0
σ (Bias1)	---	3.270E+0	3.748E+0	3.607E+0	3.199E+0
Average+3σ (Bias1)	---	1.040E+1	1.125E+1	1.241E+1	1.141E+1
Average-3σ (Bias1)	---	-9.222E+0	-1.123E+1	-9.232E+0	-7.789E+0
Average (Bias2)	---	1.762E+0	2.258E+0	1.914E+0	2.283E+0
σ (Bias2)	---	3.063E+0	2.978E+0	3.050E+0	2.723E+0
Average+3σ (Bias2)	---	1.095E+1	1.119E+1	1.106E+1	1.045E+1
Average-3σ (Bias2)	---	-7.428E+0	-6.677E+0	-7.237E+0	-5.885E+0

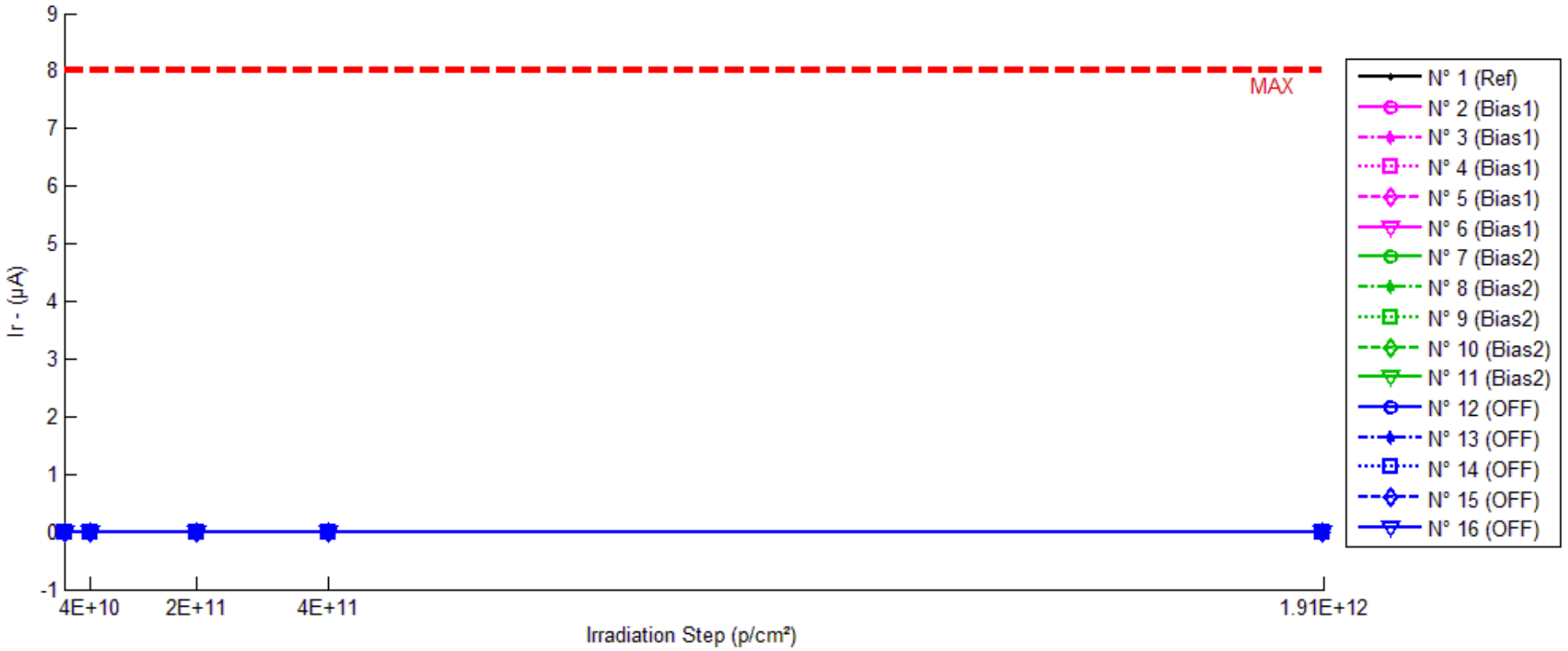
190 MeV proton / detailed results

CONTENTS

190 MeV proton / detailed results

1. Ir

Ta=25°C; VR=6V



190 MeV proton / detailed results

Ir . (µA) **Max = 8.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	9.580E-4	1.270E-3	1.039E-3	1.130E-3	1.071E-3
N° 2 (Bias1)	2.592E-4	3.320E-4	3.790E-4	3.894E-4	6.675E-4
N° 3 (Bias1)	2.503E-4	3.458E-4	3.858E-4	4.245E-4	6.838E-4
N° 4 (Bias1)	2.564E-4	1.985E-4	3.951E-4	4.529E-4	6.827E-4
N° 5 (Bias1)	2.513E-4	3.674E-4	3.927E-4	4.218E-4	6.990E-4
N° 6 (Bias1)	2.477E-4	3.413E-4	4.080E-4	4.387E-4	7.396E-4
N° 7 (Bias2)	2.475E-4	3.612E-4	4.771E-4	5.252E-4	1.088E-3
N° 8 (Bias2)	2.658E-4	3.699E-4	4.520E-4	5.213E-4	1.091E-3
N° 9 (Bias2)	2.540E-4	3.581E-4	4.234E-4	5.076E-4	1.031E-3
N° 10 (Bias2)	2.448E-4	3.565E-4	4.250E-4	5.092E-4	1.180E-3
N° 11 (Bias2)	2.648E-4	3.418E-4	4.314E-4	4.998E-4	1.130E-3
N° 12 (OFF)	2.437E-4	3.673E-4	4.533E-4	5.214E-4	1.137E-3
N° 13 (OFF)	2.479E-4	3.677E-4	4.669E-4	4.796E-4	1.222E-3
N° 14 (OFF)	2.476E-4	3.801E-4	4.929E-4	4.826E-4	1.116E-3
N° 15 (OFF)	2.430E-4	3.684E-4	4.499E-4	4.748E-4	1.177E-3
N° 16 (OFF)	2.449E-4	3.697E-4	4.289E-4	5.167E-4	1.154E-3

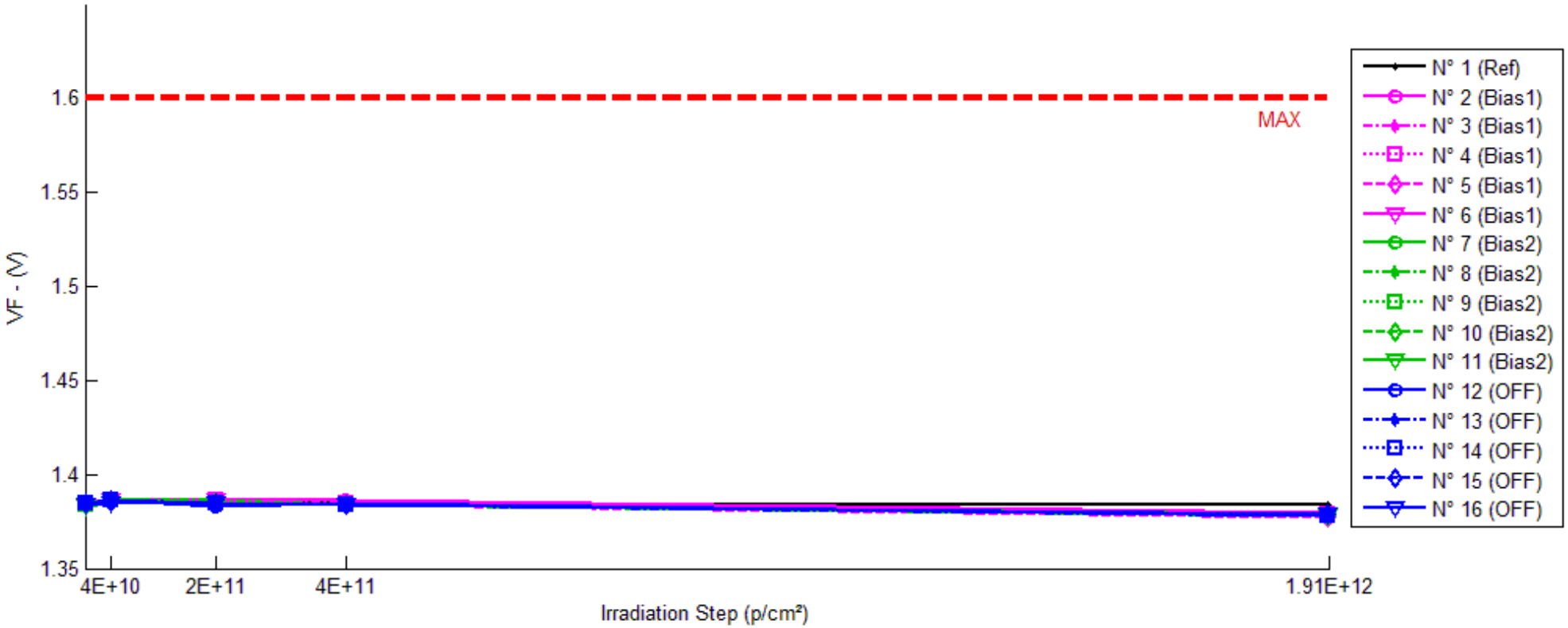
Delta [Ir]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	3.123E-4	8.094E-5	1.717E-4	1.130E-4
N° 2 (Bias1)	---	7.281E-5	1.198E-4	1.303E-4	4.084E-4
N° 3 (Bias1)	---	9.552E-5	1.356E-4	1.742E-4	4.336E-4
N° 4 (Bias1)	---	-5.793E-5	1.387E-4	1.964E-4	4.263E-4
N° 5 (Bias1)	---	1.160E-4	1.413E-4	1.705E-4	4.477E-4
N° 6 (Bias1)	---	9.364E-5	1.603E-4	1.910E-4	4.919E-4
N° 7 (Bias2)	---	1.137E-4	2.296E-4	2.777E-4	8.408E-4
N° 8 (Bias2)	---	1.041E-4	1.862E-4	2.555E-4	8.250E-4
N° 9 (Bias2)	---	1.041E-4	1.694E-4	2.536E-4	7.767E-4
N° 10 (Bias2)	---	1.117E-4	1.802E-4	2.644E-4	9.355E-4
N° 11 (Bias2)	---	7.700E-5	1.666E-4	2.351E-4	8.656E-4
N° 12 (OFF)	---	1.236E-4	2.096E-4	2.777E-4	8.938E-4
N° 13 (OFF)	---	1.198E-4	2.190E-4	2.317E-4	9.737E-4
N° 14 (OFF)	---	1.324E-4	2.453E-4	2.349E-4	8.688E-4
N° 15 (OFF)	---	1.254E-4	2.069E-4	2.318E-4	9.341E-4
N° 16 (OFF)	---	1.249E-4	1.840E-4	2.718E-4	9.095E-4
Average (OFF)	---	6.401E-5	1.391E-4	1.725E-4	4.416E-4
σ (OFF)	---	6.986E-5	1.448E-5	2.600E-5	3.151E-5
Average+3σ (OFF)	---	2.736E-4	1.826E-4	2.504E-4	5.361E-4
Average-3σ (OFF)	---	-1.456E-4	9.568E-5	9.448E-5	3.470E-4
Average (Bias1)	---	1.021E-4	1.864E-4	2.573E-4	8.487E-4
σ (Bias1)	---	1.471E-5	2.541E-5	1.564E-5	5.838E-5
Average+3σ (Bias1)	---	1.463E-4	2.626E-4	3.042E-4	1.024E-3
Average-3σ (Bias1)	---	5.798E-5	1.102E-4	2.103E-4	6.736E-4
Average (Bias2)	---	1.252E-4	2.130E-4	2.496E-4	9.160E-4
σ (Bias2)	---	4.580E-6	2.216E-5	2.312E-5	4.004E-5
Average+3σ (Bias2)	---	1.389E-4	2.795E-4	3.190E-4	1.036E-3
Average-3σ (Bias2)	---	1.115E-4	1.465E-4	1.802E-4	7.959E-4

190 MeV proton / detailed results

2. VF

Ta=25°C; If=10mA



190 MeV proton / detailed results

VF . (V) **Max = 1.6**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	1.385	1.385	1.385	1.385	1.384
N° 2 (Bias1)	1.385	1.387	1.386	1.386	1.380
N° 3 (Bias1)	1.385	1.387	1.386	1.385	1.379
N° 4 (Bias1)	1.384	1.386	1.386	1.385	1.379
N° 5 (Bias1)	1.384	1.386	1.385	1.384	1.377
N° 6 (Bias1)	1.384	1.386	1.386	1.384	1.378
N° 7 (Bias2)	1.384	1.387	1.385	1.384	1.379
N° 8 (Bias2)	1.383	1.387	1.386	1.384	1.379
N° 9 (Bias2)	1.384	1.386	1.385	1.384	1.378
N° 10 (Bias2)	1.384	1.386	1.385	1.384	1.378
N° 11 (Bias2)	1.383	1.385	1.385	1.384	1.378
N° 12 (OFF)	1.385	1.386	1.383	1.385	1.378
N° 13 (OFF)	1.385	1.386	1.385	1.384	1.378
N° 14 (OFF)	1.385	1.386	1.385	1.384	1.378
N° 15 (OFF)	1.385	1.386	1.385	1.384	1.379
N° 16 (OFF)	1.384	1.385	1.385	1.384	1.379

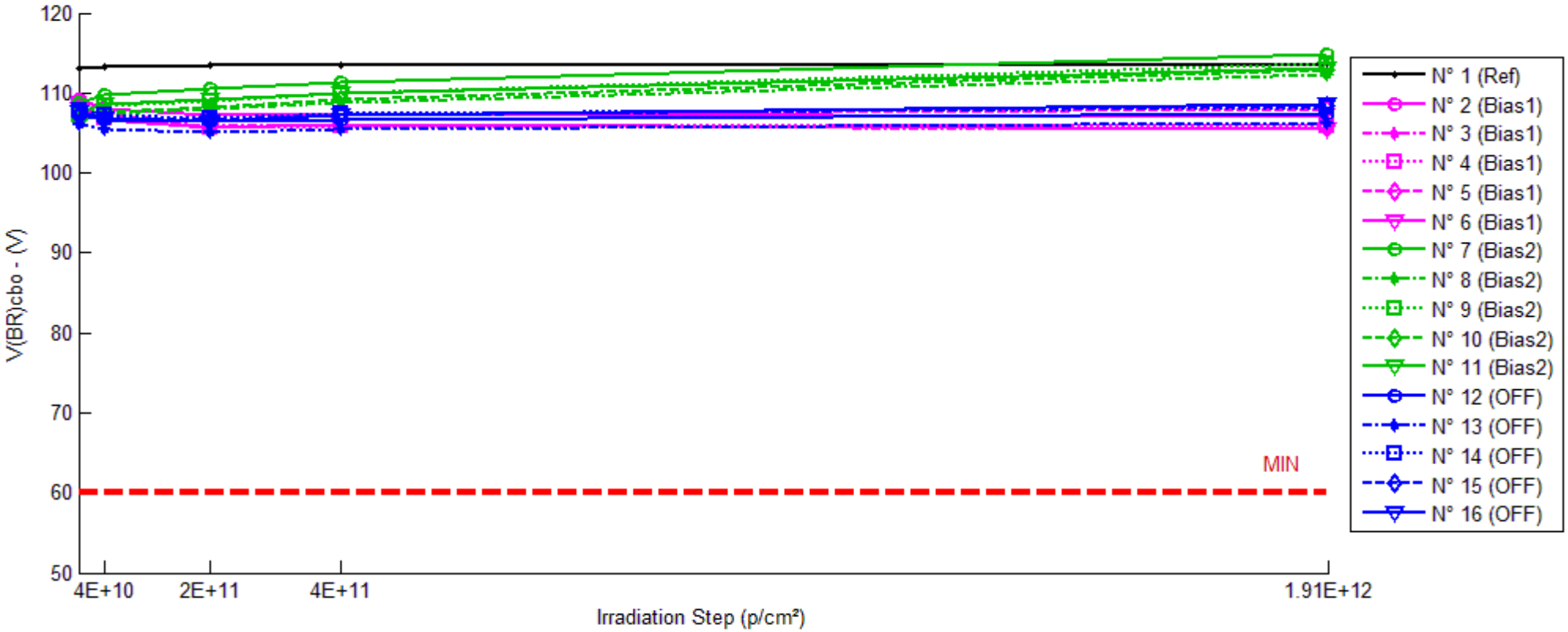
Delta [VF]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	3.440E-4	1.970E-4	5.430E-4	-6.100E-4
N° 2 (Bias1)	---	1.856E-3	5.960E-4	6.030E-4	-5.639E-3
N° 3 (Bias1)	---	1.900E-3	1.195E-3	4.780E-4	-5.424E-3
N° 4 (Bias1)	---	2.464E-3	1.886E-3	1.112E-3	-5.079E-3
N° 5 (Bias1)	---	1.816E-3	1.265E-3	3.770E-4	-6.844E-3
N° 6 (Bias1)	---	2.072E-3	1.602E-3	-2.920E-4	-5.742E-3
N° 7 (Bias2)	---	2.709E-3	1.464E-3	5.120E-4	-4.876E-3
N° 8 (Bias2)	---	3.817E-3	2.689E-3	1.203E-3	-4.302E-3
N° 9 (Bias2)	---	2.210E-3	1.714E-3	8.100E-5	-5.168E-3
N° 10 (Bias2)	---	2.472E-3	1.309E-3	3.040E-4	-5.896E-3
N° 11 (Bias2)	---	1.865E-3	1.180E-3	1.950E-4	-5.210E-3
N° 12 (OFF)	---	8.030E-4	-2.039E-3	2.220E-4	-7.119E-3
N° 13 (OFF)	---	1.402E-3	2.580E-4	-3.050E-4	-6.453E-3
N° 14 (OFF)	---	1.513E-3	-1.250E-4	-3.820E-4	-6.290E-3
N° 15 (OFF)	---	1.470E-3	1.980E-4	-5.120E-4	-6.126E-3
N° 16 (OFF)	---	8.380E-4	6.410E-4	-4.510E-4	-5.802E-3
Average (OFF)	---	2.022E-3	1.309E-3	4.556E-4	-5.746E-3
σ (OFF)	---	2.659E-4	4.853E-4	5.045E-4	6.644E-4
Average+3σ (OFF)	---	2.819E-3	2.765E-3	1.969E-3	-3.752E-3
Average-3σ (OFF)	---	1.224E-3	-1.471E-4	-1.058E-3	-7.739E-3
Average (Bias1)	---	2.615E-3	1.671E-3	4.590E-4	-5.090E-3
σ (Bias1)	---	7.417E-4	6.027E-4	4.452E-4	5.781E-4
Average+3σ (Bias1)	---	4.840E-3	3.479E-3	1.795E-3	-3.356E-3
Average-3σ (Bias1)	---	3.894E-4	-1.370E-4	-8.767E-4	-6.825E-3
Average (Bias2)	---	1.205E-3	-2.134E-4	-2.856E-4	-6.358E-3
σ (Bias2)	---	3.536E-4	1.056E-3	2.941E-4	4.888E-4
Average+3σ (Bias2)	---	2.266E-3	2.955E-3	5.967E-4	-4.892E-3
Average-3σ (Bias2)	---	1.443E-4	-3.382E-3	-1.168E-3	-7.824E-3

190 MeV proton / detailed results

3. V(BR)cbo

Ta=25°C; Ic=100µA; Ib=0; If=0



190 MeV proton / detailed results

V(BR)cbo . (V) **Min = 60.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	113.06	113.33	113.40	113.42	113.57
N° 2 (Bias1)	109.22	108.03	107.25	107.44	107.12
N° 3 (Bias1)	108.18	106.76	105.77	105.86	105.56
N° 4 (Bias1)	108.52	106.78	105.73	105.87	105.84
N° 5 (Bias1)	108.25	107.14	106.52	107.21	108.09
N° 6 (Bias1)	107.96	106.71	105.73	106.02	105.54
N° 7 (Bias2)	108.88	109.81	110.49	111.28	114.88
N° 8 (Bias2)	106.61	107.33	107.95	108.70	112.29
N° 9 (Bias2)	107.30	108.41	109.08	109.94	113.60
N° 10 (Bias2)	106.68	107.62	108.29	109.11	112.98
N° 11 (Bias2)	107.62	108.68	109.21	109.87	113.15
N° 12 (OFF)	107.20	106.70	106.44	106.69	107.43
N° 13 (OFF)	106.07	105.57	105.07	105.38	106.17
N° 14 (OFF)	107.73	107.22	106.92	107.33	108.23
N° 15 (OFF)	107.22	106.86	106.61	107.19	108.44
N° 16 (OFF)	107.57	106.82	106.49	107.23	108.67

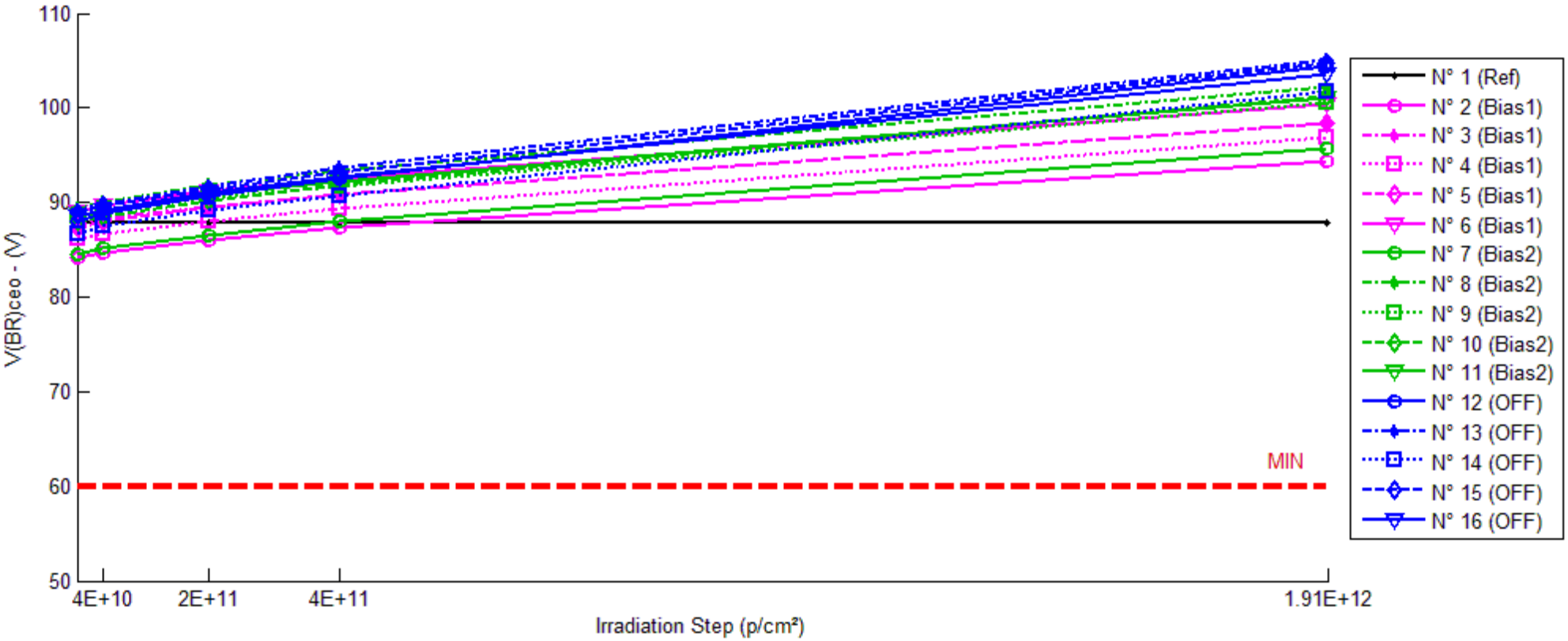
Delta [V(BR)cbo]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.744E-1	3.401E-1	3.644E-1	5.087E-1
N° 2 (Bias1)	---	-1.191E+0	-1.977E+0	-1.782E+0	-2.108E+0
N° 3 (Bias1)	---	-1.414E+0	-2.409E+0	-2.319E+0	-2.617E+0
N° 4 (Bias1)	---	-1.740E+0	-2.790E+0	-2.651E+0	-2.684E+0
N° 5 (Bias1)	---	-1.112E+0	-1.731E+0	-1.044E+0	-1.641E-1
N° 6 (Bias1)	---	-1.249E+0	-2.226E+0	-1.941E+0	-2.419E+0
N° 7 (Bias2)	---	9.263E-1	1.611E+0	2.397E+0	6.004E+0
N° 8 (Bias2)	---	7.242E-1	1.336E+0	2.090E+0	5.680E+0
N° 9 (Bias2)	---	1.114E+0	1.782E+0	2.640E+0	6.302E+0
N° 10 (Bias2)	---	9.388E-1	1.607E+0	2.427E+0	6.299E+0
N° 11 (Bias2)	---	1.059E+0	1.591E+0	2.251E+0	5.526E+0
N° 12 (OFF)	---	-4.980E-1	-7.591E-1	-5.034E-1	2.303E-1
N° 13 (OFF)	---	-5.008E-1	-1.006E+0	-6.943E-1	9.350E-2
N° 14 (OFF)	---	-5.146E-1	-8.110E-1	-3.995E-1	5.033E-1
N° 15 (OFF)	---	-3.602E-1	-6.076E-1	-2.650E-2	1.221E+0
N° 16 (OFF)	---	-7.501E-1	-1.072E+0	-3.395E-1	1.106E+0
Average (OFF)	---	-1.341E+0	-2.227E+0	-1.947E+0	-1.998E+0
σ (OFF)	---	2.491E-1	4.057E-1	6.076E-1	1.050E+0
Average+3σ (OFF)	---	-5.942E-1	-1.009E+0	-1.247E-1	1.150E+0
Average-3σ (OFF)	---	-2.089E+0	-3.444E+0	-3.770E+0	-5.147E+0
Average (Bias1)	---	9.524E-1	1.586E+0	2.361E+0	5.962E+0
σ (Bias1)	---	1.502E-1	1.600E-1	2.056E-1	3.538E-1
Average+3σ (Bias1)	---	1.403E+0	2.066E+0	2.978E+0	7.024E+0
Average-3σ (Bias1)	---	5.017E-1	1.106E+0	1.744E+0	4.901E+0
Average (Bias2)	---	-5.247E-1	-8.511E-1	-3.926E-1	6.308E-1
σ (Bias2)	---	1.408E-1	1.884E-1	2.450E-1	5.097E-1
Average+3σ (Bias2)	---	-1.025E-1	-2.859E-1	3.425E-1	2.160E+0
Average-3σ (Bias2)	---	-9.470E-1	-1.416E+0	-1.128E+0	-8.984E-1

190 MeV proton / detailed results

4. V(BR)ceo

Ta=25°C; Ic=1mA; Ib=0; If=0



190 MeV proton / detailed results

V(BR)ceo . (V) **Min = 60.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	87.86	87.83	87.82	87.81	87.83
N° 2 (Bias1)	84.13	84.65	86.01	87.28	94.36
N° 3 (Bias1)	87.65	88.30	89.60	90.86	98.35
N° 4 (Bias1)	86.18	86.66	88.07	89.34	96.82
N° 5 (Bias1)	87.34	87.95	89.55	90.82	98.46
N° 6 (Bias1)	89.05	89.64	91.23	92.60	100.47
N° 7 (Bias2)	84.49	85.12	86.51	88.02	95.76
N° 8 (Bias2)	89.30	89.97	91.81	93.35	102.27
N° 9 (Bias2)	88.47	89.07	90.56	91.78	100.48
N° 10 (Bias2)	87.94	88.56	90.27	91.86	101.18
N° 11 (Bias2)	88.49	89.16	90.78	92.21	101.02
N° 12 (OFF)	88.05	88.87	90.76	92.57	104.48
N° 13 (OFF)	89.14	89.89	91.75	93.64	105.12
N° 14 (OFF)	86.63	87.45	89.18	90.72	101.73
N° 15 (OFF)	88.91	89.75	91.42	93.22	104.76
N° 16 (OFF)	88.49	89.24	91.04	92.72	103.55

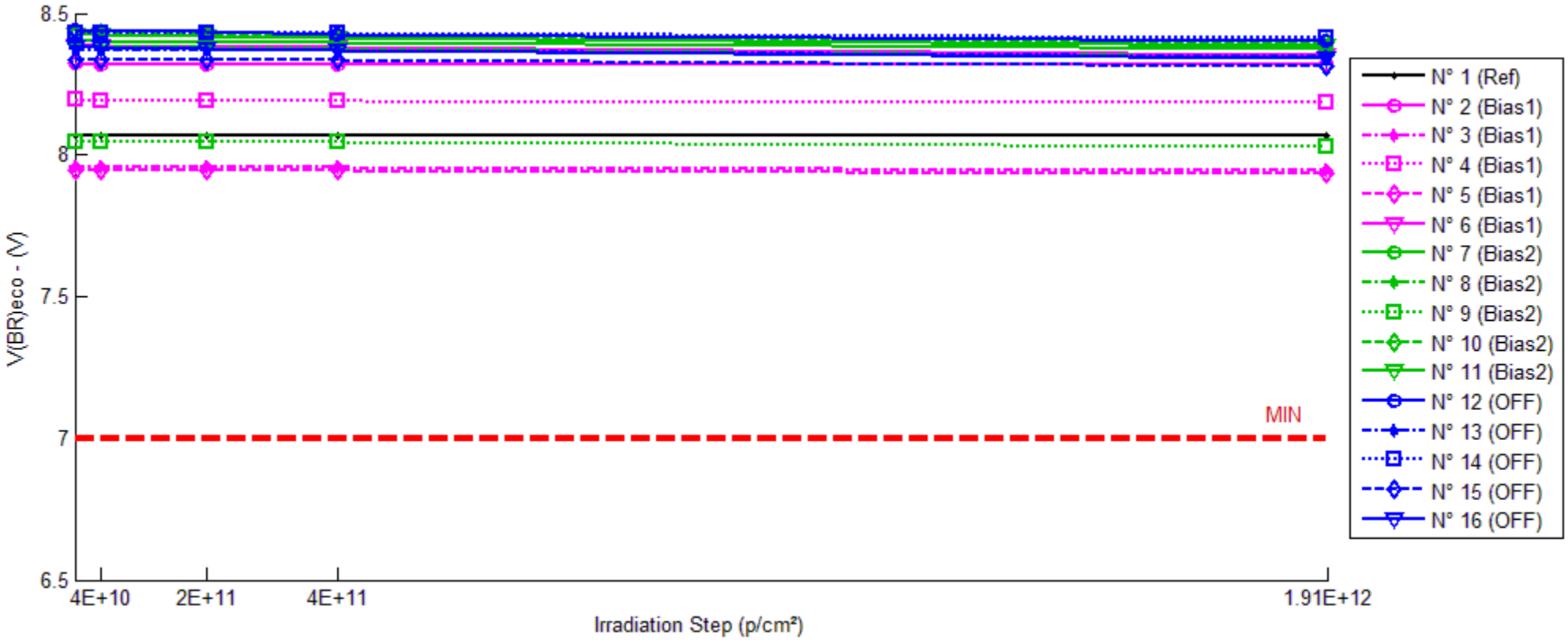
Delta [V(BR)ceo]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-3.022E-2	-3.539E-2	-4.858E-2	-3.052E-2
N° 2 (Bias1)	---	5.221E-1	1.880E+0	3.151E+0	1.023E+1
N° 3 (Bias1)	---	6.468E-1	1.954E+0	3.207E+0	1.070E+1
N° 4 (Bias1)	---	4.818E-1	1.895E+0	3.166E+0	1.064E+1
N° 5 (Bias1)	---	6.083E-1	2.207E+0	3.479E+0	1.112E+1
N° 6 (Bias1)	---	5.896E-1	2.180E+0	3.546E+0	1.142E+1
N° 7 (Bias2)	---	6.269E-1	2.016E+0	3.528E+0	1.127E+1
N° 8 (Bias2)	---	6.695E-1	2.503E+0	4.050E+0	1.296E+1
N° 9 (Bias2)	---	5.964E-1	2.089E+0	3.312E+0	1.201E+1
N° 10 (Bias2)	---	6.220E-1	2.331E+0	3.927E+0	1.324E+1
N° 11 (Bias2)	---	6.704E-1	2.296E+0	3.721E+0	1.253E+1
N° 12 (OFF)	---	8.164E-1	2.712E+0	4.516E+0	1.643E+1
N° 13 (OFF)	---	7.542E-1	2.611E+0	4.505E+0	1.598E+1
N° 14 (OFF)	---	8.205E-1	2.553E+0	4.094E+0	1.510E+1
N° 15 (OFF)	---	8.449E-1	2.509E+0	4.310E+0	1.585E+1
N° 16 (OFF)	---	7.496E-1	2.542E+0	4.225E+0	1.505E+1
Average (OFF)	---	5.697E-1	2.023E+0	3.310E+0	1.082E+1
σ (OFF)	---	6.676E-2	1.583E-1	1.876E-1	4.586E-1
Average+3σ (OFF)	---	7.700E-1	2.498E+0	3.873E+0	1.220E+1
Average-3σ (OFF)	---	3.694E-1	1.548E+0	2.747E+0	9.448E+0
Average (Bias1)	---	6.370E-1	2.247E+0	3.707E+0	1.240E+1
σ (Bias1)	---	3.219E-2	1.960E-1	2.977E-1	7.872E-1
Average+3σ (Bias1)	---	7.336E-1	2.835E+0	4.601E+0	1.476E+1
Average-3σ (Bias1)	---	5.405E-1	1.659E+0	2.814E+0	1.004E+1
Average (Bias2)	---	7.972E-1	2.586E+0	4.330E+0	1.568E+1
σ (Bias2)	---	4.274E-2	7.968E-2	1.819E-1	5.939E-1
Average+3σ (Bias2)	---	9.254E-1	2.825E+0	4.876E+0	1.746E+1
Average-3σ (Bias2)	---	6.689E-1	2.347E+0	3.784E+0	1.390E+1

190 MeV proton / detailed results

5. V(BR)eco

Ta=25°C; Ic=0; Ie=100µA; If=0



190 MeV proton / detailed results

V(BR)eco . (V) **Min = 7.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	8.070	8.070	8.070	8.070	8.071
N° 2 (Bias1)	8.324	8.321	8.319	8.319	8.318
N° 3 (Bias1)	7.959	7.958	7.957	7.957	7.943
N° 4 (Bias1)	8.195	8.191	8.191	8.191	8.187
N° 5 (Bias1)	7.948	7.948	7.947	7.946	7.932
N° 6 (Bias1)	8.387	8.385	8.383	8.379	8.354
N° 7 (Bias2)	8.402	8.400	8.398	8.395	8.373
N° 8 (Bias2)	8.386	8.382	8.379	8.376	8.347
N° 9 (Bias2)	8.047	8.046	8.045	8.045	8.032
N° 10 (Bias2)	8.431	8.428	8.425	8.421	8.395
N° 11 (Bias2)	8.426	8.423	8.418	8.413	8.386
N° 12 (OFF)	8.439	8.437	8.435	8.427	8.402
N° 13 (OFF)	8.372	8.370	8.370	8.367	8.346
N° 14 (OFF)	8.433	8.432	8.432	8.429	8.412
N° 15 (OFF)	8.334	8.333	8.333	8.333	8.316
N° 16 (OFF)	8.379	8.378	8.374	8.369	8.343

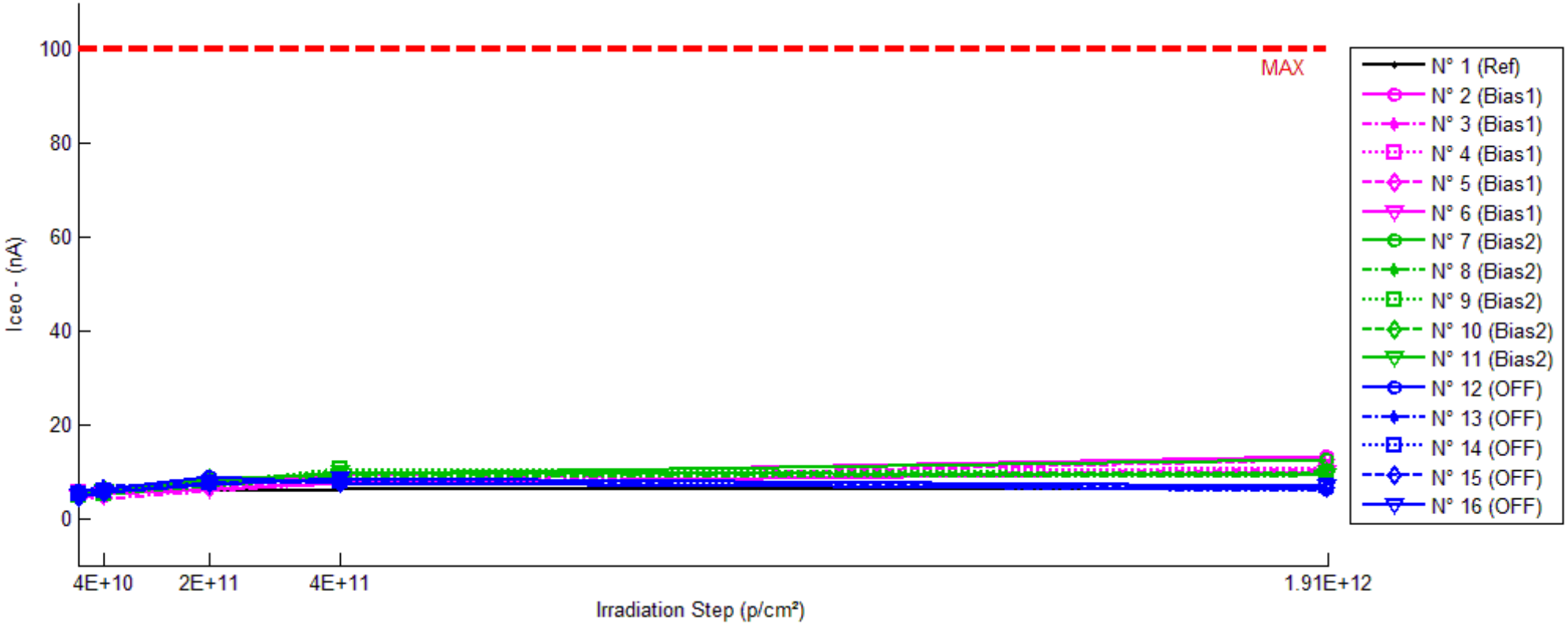
Delta [V(BR)eco]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	1.970E-4	2.250E-4	-5.100E-5	1.002E-3
N° 2 (Bias1)	---	-2.343E-3	-4.219E-3	-4.498E-3	-5.165E-3
N° 3 (Bias1)	---	-1.019E-3	-1.437E-3	-1.560E-3	-1.557E-2
N° 4 (Bias1)	---	-3.490E-3	-4.338E-3	-4.057E-3	-7.865E-3
N° 5 (Bias1)	---	-4.290E-4	-1.643E-3	-2.749E-3	-1.620E-2
N° 6 (Bias1)	---	-2.212E-3	-4.106E-3	-7.588E-3	-3.325E-2
N° 7 (Bias2)	---	-2.360E-3	-4.690E-3	-7.735E-3	-2.934E-2
N° 8 (Bias2)	---	-3.970E-3	-6.610E-3	-1.004E-2	-3.906E-2
N° 9 (Bias2)	---	-5.920E-4	-2.007E-3	-1.277E-3	-1.471E-2
N° 10 (Bias2)	---	-2.851E-3	-6.053E-3	-9.748E-3	-3.603E-2
N° 11 (Bias2)	---	-2.513E-3	-7.481E-3	-1.262E-2	-3.991E-2
N° 12 (OFF)	---	-1.566E-3	-3.855E-3	-1.238E-2	-3.749E-2
N° 13 (OFF)	---	-1.092E-3	-1.983E-3	-4.495E-3	-2.586E-2
N° 14 (OFF)	---	-5.030E-4	-1.073E-3	-3.414E-3	-2.065E-2
N° 15 (OFF)	---	-4.220E-4	-2.510E-4	-1.056E-3	-1.769E-2
N° 16 (OFF)	---	-8.500E-4	-5.472E-3	-1.049E-2	-3.630E-2
Average (OFF)	---	-1.899E-3	-3.149E-3	-4.090E-3	-1.561E-2
σ (OFF)	---	1.200E-3	1.473E-3	2.270E-3	1.096E-2
Average+3σ (OFF)	---	1.702E-3	1.269E-3	2.718E-3	1.727E-2
Average-3σ (OFF)	---	-5.499E-3	-7.566E-3	-1.090E-2	-4.849E-2
Average (Bias1)	---	-2.457E-3	-5.368E-3	-8.284E-3	-3.181E-2
σ (Bias1)	---	1.218E-3	2.135E-3	4.285E-3	1.042E-2
Average+3σ (Bias1)	---	1.197E-3	1.037E-3	4.571E-3	-5.411E-4
Average-3σ (Bias1)	---	-6.112E-3	-1.177E-2	-2.114E-2	-6.308E-2
Average (Bias2)	---	-8.866E-4	-2.527E-3	-6.368E-3	-2.760E-2
σ (Bias2)	---	4.659E-4	2.123E-3	4.838E-3	8.986E-3
Average+3σ (Bias2)	---	5.110E-4	3.842E-3	8.147E-3	-6.392E-4
Average-3σ (Bias2)	---	-2.284E-3	-8.896E-3	-2.088E-2	-5.456E-2

190 MeV proton / detailed results

6. Iceo

Ta=25°C; Vce=20V; If=0; Ib=0



190 MeV proton / detailed results

Iceo . (nA) **Max = 100.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	5.506	6.267	5.819	6.259	6.244
N° 2 (Bias1)	5.539	5.819	7.640	9.214	13.148
N° 3 (Bias1)	4.360	4.255	6.041	7.607	10.423
N° 4 (Bias1)	5.397	5.639	7.296	8.726	10.803
N° 5 (Bias1)	5.003	5.519	6.571	8.030	12.628
N° 6 (Bias1)	4.667	5.338	6.081	7.488	9.991
N° 7 (Bias2)	4.947	5.582	8.306	9.439	12.562
N° 8 (Bias2)	4.798	5.052	6.866	8.811	9.277
N° 9 (Bias2)	4.858	5.219	7.575	10.547	9.677
N° 10 (Bias2)	5.163	6.279	8.658	9.270	9.852
N° 11 (Bias2)	4.784	5.900	7.466	9.867	9.299
N° 12 (OFF)	5.824	6.137	8.765	7.419	6.129
N° 13 (OFF)	5.871	6.887	7.476	8.015	5.982
N° 14 (OFF)	5.083	5.715	7.657	7.837	6.813
N° 15 (OFF)	4.482	5.406	7.523	7.413	6.461
N° 16 (OFF)	4.962	5.635	7.173	8.549	6.975

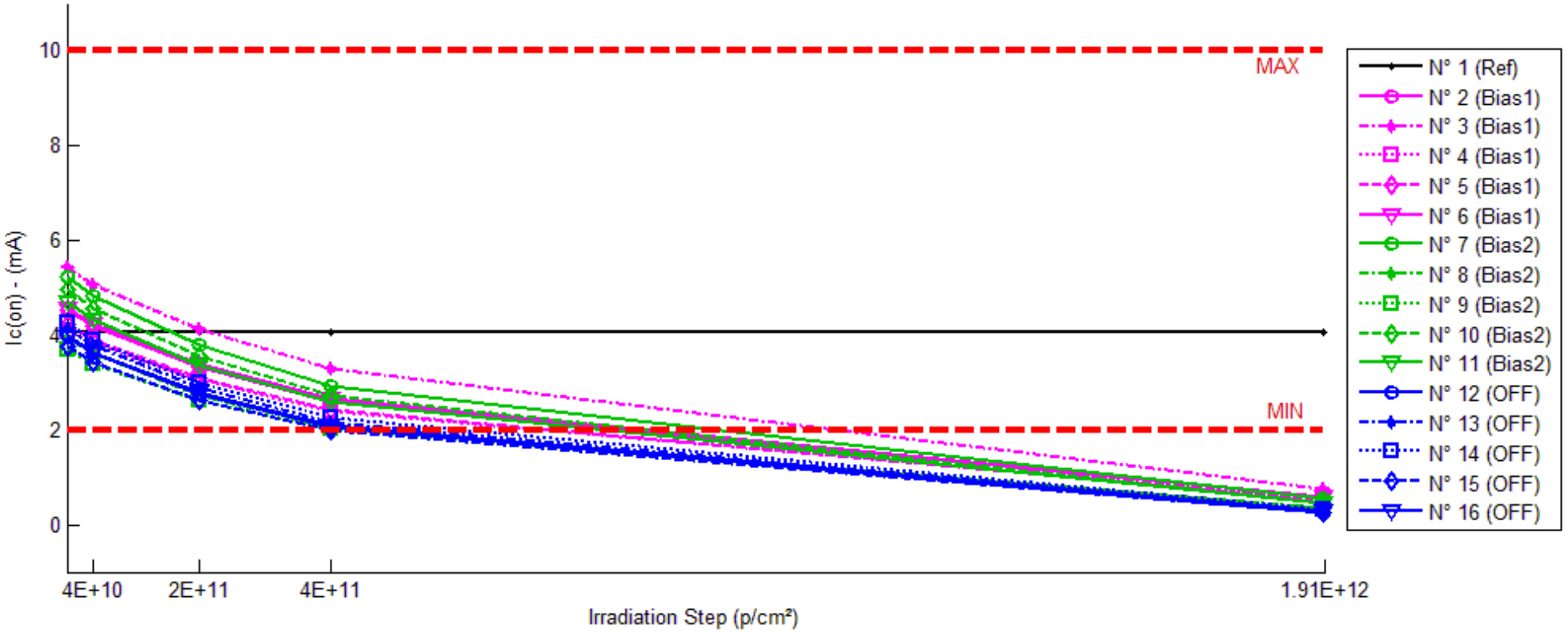
Delta [Iceo]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	7.610E-1	3.131E-1	7.528E-1	7.378E-1
N° 2 (Bias1)	---	2.809E-1	2.102E+0	3.676E+0	7.609E+0
N° 3 (Bias1)	---	-1.048E-1	1.681E+0	3.247E+0	6.064E+0
N° 4 (Bias1)	---	2.422E-1	1.900E+0	3.330E+0	5.406E+0
N° 5 (Bias1)	---	5.162E-1	1.567E+0	3.027E+0	7.624E+0
N° 6 (Bias1)	---	6.703E-1	1.413E+0	2.820E+0	5.324E+0
N° 7 (Bias2)	---	6.354E-1	3.359E+0	4.492E+0	7.615E+0
N° 8 (Bias2)	---	2.542E-1	2.068E+0	4.013E+0	4.479E+0
N° 9 (Bias2)	---	3.610E-1	2.717E+0	5.689E+0	4.818E+0
N° 10 (Bias2)	---	1.116E+0	3.495E+0	4.107E+0	4.689E+0
N° 11 (Bias2)	---	1.116E+0	2.681E+0	5.083E+0	4.515E+0
N° 12 (OFF)	---	3.128E-1	2.941E+0	1.595E+0	3.052E-1
N° 13 (OFF)	---	1.016E+0	1.605E+0	2.144E+0	1.113E-1
N° 14 (OFF)	---	6.323E-1	2.574E+0	2.754E+0	1.729E+0
N° 15 (OFF)	---	9.241E-1	3.041E+0	2.932E+0	1.979E+0
N° 16 (OFF)	---	6.732E-1	2.211E+0	3.587E+0	2.013E+0
Average (OFF)	---	3.209E-1	1.733E+0	3.220E+0	6.405E+0
σ (OFF)	---	2.955E-1	2.720E-1	3.230E-1	1.142E+0
Average+3σ (OFF)	---	1.207E+0	2.549E+0	4.189E+0	9.833E+0
Average-3σ (OFF)	---	-5.654E-1	9.166E-1	2.251E+0	2.978E+0
Average (Bias1)	---	6.964E-1	2.864E+0	4.677E+0	5.223E+0
σ (Bias1)	---	4.072E-1	5.770E-1	7.052E-1	1.344E+0
Average+3σ (Bias1)	---	1.918E+0	4.595E+0	6.792E+0	9.255E+0
Average-3σ (Bias1)	---	-5.253E-1	1.133E+0	2.561E+0	1.191E+0
Average (Bias2)	---	7.117E-1	2.474E+0	2.602E+0	1.228E+0
σ (Bias2)	---	2.760E-1	5.860E-1	7.625E-1	9.396E-1
Average+3σ (Bias2)	---	1.540E+0	4.232E+0	4.890E+0	4.047E+0
Average-3σ (Bias2)	---	-1.163E-1	7.163E-1	3.149E-1	-1.591E+0

190 MeV proton / detailed results

7. Ic(on)

Ta=25°C;Vce=5V; If=1mA; Ib=0



190 MeV proton / detailed results

Ic(on) . (mA) **Min = 2.0 Max = 10.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	4.090	4.063	4.074	4.079	4.074
N° 2 (Bias1)	4.518	4.186	3.313	2.596	0.580
N° 3 (Bias1)	5.434	5.053	4.126	3.289	0.744
N° 4 (Bias1)	4.092	3.827	3.050	2.394	0.563
N° 5 (Bias1)	4.226	3.902	3.087	2.416	0.506
N° 6 (Bias1)	4.556	4.233	3.389	2.653	0.584
N° 7 (Bias2)	5.235	4.844	3.810	2.927	0.550
N° 8 (Bias2)	3.938	3.618	2.741	2.075	0.347
N° 9 (Bias2)	3.689	3.406	2.632	2.027	0.359
N° 10 (Bias2)	4.956	4.582	3.560	2.719	0.467
N° 11 (Bias2)	4.702	4.336	3.377	2.596	0.463
N° 12 (OFF)	3.982	3.636	2.761	2.065	0.255
N° 13 (OFF)	4.127	3.793	2.899	2.144	0.278
N° 14 (OFF)	4.258	3.901	2.995	2.256	0.304
N° 15 (OFF)	3.762	3.426	2.643	1.976	0.257
N° 16 (OFF)	3.976	3.640	2.781	2.085	0.295

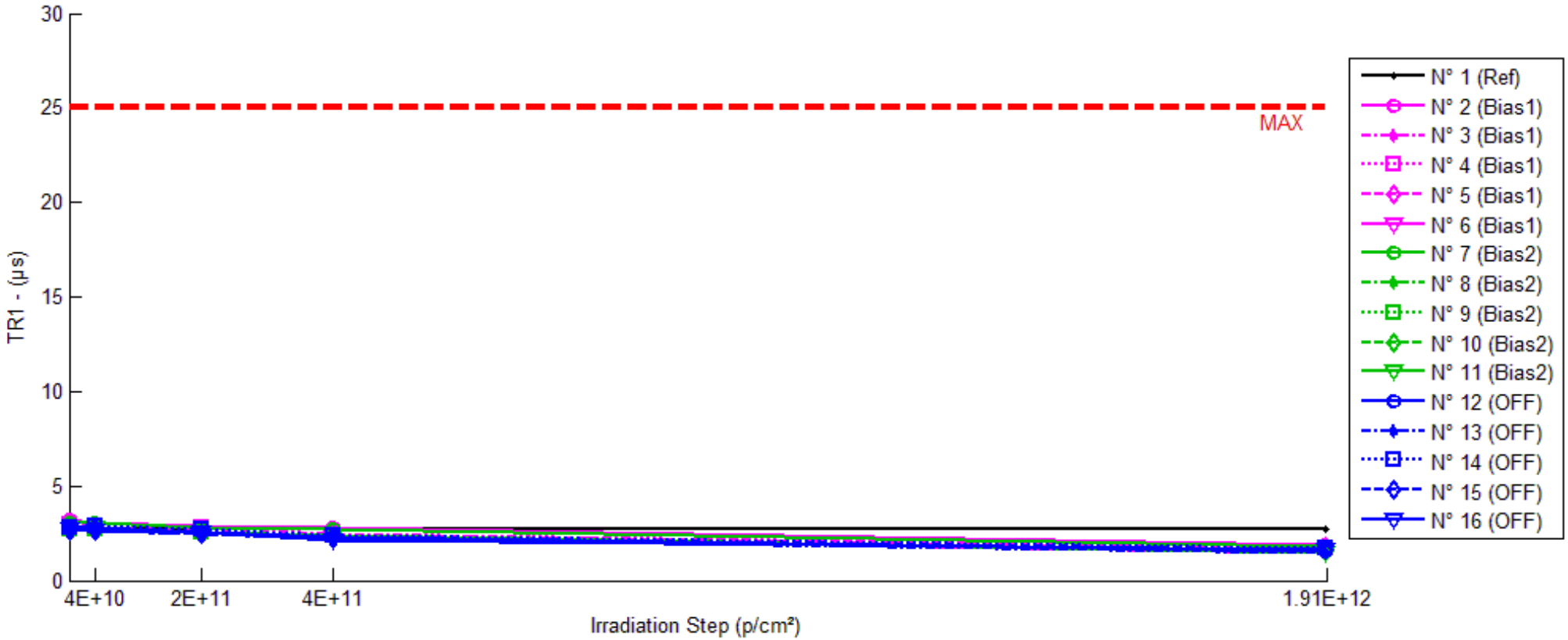
Delta [Ic(on)]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-2.688E-2	-1.544E-2	-1.033E-2	-1.602E-2
N° 2 (Bias1)	---	-3.319E-1	-1.205E+0	-1.922E+0	-3.938E+0
N° 3 (Bias1)	---	-3.808E-1	-1.308E+0	-2.146E+0	-4.691E+0
N° 4 (Bias1)	---	-2.648E-1	-1.043E+0	-1.699E+0	-3.529E+0
N° 5 (Bias1)	---	-3.240E-1	-1.139E+0	-1.811E+0	-3.720E+0
N° 6 (Bias1)	---	-3.237E-1	-1.167E+0	-1.904E+0	-3.973E+0
N° 7 (Bias2)	---	-3.912E-1	-1.425E+0	-2.308E+0	-4.685E+0
N° 8 (Bias2)	---	-3.204E-1	-1.197E+0	-1.863E+0	-3.591E+0
N° 9 (Bias2)	---	-2.828E-1	-1.057E+0	-1.662E+0	-3.331E+0
N° 10 (Bias2)	---	-3.741E-1	-1.396E+0	-2.237E+0	-4.489E+0
N° 11 (Bias2)	---	-3.653E-1	-1.325E+0	-2.106E+0	-4.238E+0
N° 12 (OFF)	---	-3.461E-1	-1.221E+0	-1.917E+0	-3.728E+0
N° 13 (OFF)	---	-3.340E-1	-1.227E+0	-1.982E+0	-3.849E+0
N° 14 (OFF)	---	-3.573E-1	-1.264E+0	-2.002E+0	-3.955E+0
N° 15 (OFF)	---	-3.366E-1	-1.119E+0	-1.787E+0	-3.505E+0
N° 16 (OFF)	---	-3.364E-1	-1.195E+0	-1.892E+0	-3.682E+0
Average (OFF)	---	-3.250E-1	-1.173E+0	-1.896E+0	-3.970E+0
σ (OFF)	---	4.118E-2	9.688E-2	1.653E-1	4.409E-1
Average+3σ (OFF)	---	-2.015E-1	-8.819E-1	-1.400E+0	-2.647E+0
Average-3σ (OFF)	---	-4.486E-1	-1.463E+0	-2.392E+0	-5.293E+0
Average (Bias1)	---	-3.467E-1	-1.280E+0	-2.035E+0	-4.067E+0
σ (Bias1)	---	4.429E-2	1.526E-1	2.687E-1	5.827E-1
Average+3σ (Bias1)	---	-2.139E-1	-8.224E-1	-1.229E+0	-2.319E+0
Average-3σ (Bias1)	---	-4.796E-1	-1.738E+0	-2.841E+0	-5.815E+0
Average (Bias2)	---	-3.421E-1	-1.205E+0	-1.916E+0	-3.744E+0
σ (Bias2)	---	9.698E-3	5.393E-2	8.539E-2	1.707E-1
Average+3σ (Bias2)	---	-3.130E-1	-1.044E+0	-1.660E+0	-3.231E+0
Average-3σ (Bias2)	---	-3.712E-1	-1.367E+0	-2.172E+0	-4.256E+0

190 MeV proton / detailed results

8. TR1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



190 MeV proton / detailed results

TR1 . (µs) **Max = 25.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	2.72	2.72	2.68	2.68	2.72
N° 2 (Bias1)	3.24	3.08	2.92	2.80	1.92
N° 3 (Bias1)	2.88	2.80	2.68	2.48	1.64
N° 4 (Bias1)	2.96	2.92	2.76	2.48	1.68
N° 5 (Bias1)	2.76	2.72	2.56	2.36	1.80
N° 6 (Bias1)	2.68	2.68	2.56	2.32	1.44
N° 7 (Bias2)	3.08	3.04	2.84	2.68	1.76
N° 8 (Bias2)	2.72	2.72	2.48	2.20	1.52
N° 9 (Bias2)	2.68	2.68	2.52	2.40	1.68
N° 10 (Bias2)	2.76	2.76	2.56	2.36	1.56
N° 11 (Bias2)	2.68	2.76	2.56	2.36	1.44
N° 12 (OFF)	2.80	2.84	2.52	2.28	1.56
N° 13 (OFF)	2.76	2.64	2.44	2.20	1.44
N° 14 (OFF)	2.84	2.88	2.72	2.40	1.72
N° 15 (OFF)	2.64	2.64	2.48	2.32	1.64
N° 16 (OFF)	2.68	2.64	2.52	2.16	1.64

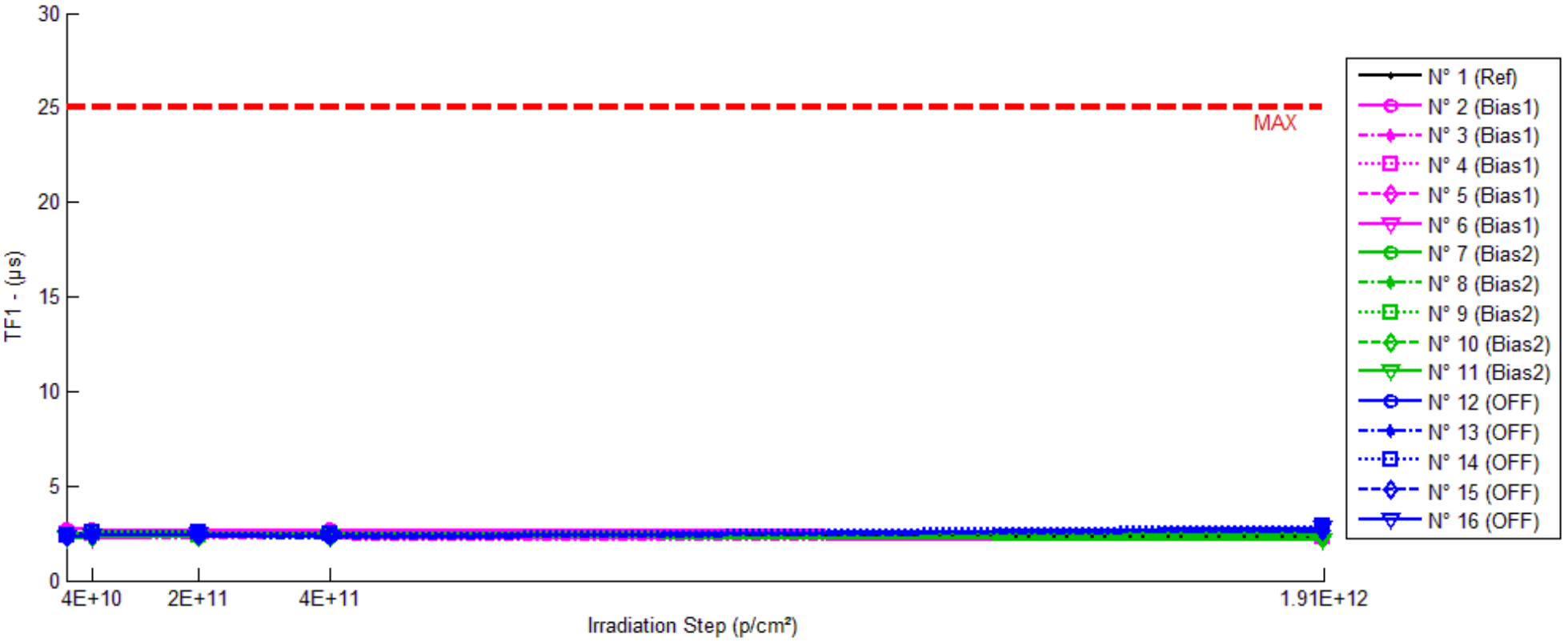
Delta [TR1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-4.000E-2	-4.000E-2	0.000E+0
N° 2 (Bias1)	---	-1.600E-1	-3.200E-1	-4.400E-1	-1.320E+0
N° 3 (Bias1)	---	-8.000E-2	-2.000E-1	-4.000E-1	-1.240E+0
N° 4 (Bias1)	---	-4.000E-2	-2.000E-1	-4.800E-1	-1.280E+0
N° 5 (Bias1)	---	-4.000E-2	-2.000E-1	-4.000E-1	-9.600E-1
N° 6 (Bias1)	---	0.000E+0	-1.200E-1	-3.600E-1	-1.240E+0
N° 7 (Bias2)	---	-4.000E-2	-2.400E-1	-4.000E-1	-1.320E+0
N° 8 (Bias2)	---	0.000E+0	-2.400E-1	-5.200E-1	-1.200E+0
N° 9 (Bias2)	---	0.000E+0	-1.600E-1	-2.800E-1	-1.000E+0
N° 10 (Bias2)	---	0.000E+0	-2.000E-1	-4.000E-1	-1.200E+0
N° 11 (Bias2)	---	8.000E-2	-1.200E-1	-3.200E-1	-1.240E+0
N° 12 (OFF)	---	4.000E-2	-2.800E-1	-5.200E-1	-1.240E+0
N° 13 (OFF)	---	-1.200E-1	-3.200E-1	-5.600E-1	-1.320E+0
N° 14 (OFF)	---	4.000E-2	-1.200E-1	-4.400E-1	-1.120E+0
N° 15 (OFF)	---	0.000E+0	-1.600E-1	-3.200E-1	-1.000E+0
N° 16 (OFF)	---	-4.000E-2	-1.600E-1	-5.200E-1	-1.040E+0
Average (OFF)	---	-6.400E-2	-2.080E-1	-4.160E-1	-1.208E+0
σ (OFF)	---	6.066E-2	7.155E-2	4.561E-2	1.425E-1
Average+3σ (OFF)	---	1.180E-1	6.663E-3	-2.792E-1	-7.804E-1
Average-3σ (OFF)	---	-2.460E-1	-4.227E-1	-5.528E-1	-1.636E+0
Average (Bias1)	---	8.000E-3	-1.920E-1	-3.840E-1	-1.192E+0
σ (Bias1)	---	4.382E-2	5.215E-2	9.209E-2	1.180E-1
Average+3σ (Bias1)	---	1.395E-1	-3.554E-2	-1.077E-1	-8.381E-1
Average-3σ (Bias1)	---	-1.235E-1	-3.485E-1	-6.603E-1	-1.546E+0
Average (Bias2)	---	-1.600E-2	-2.080E-1	-4.720E-1	-1.144E+0
σ (Bias2)	---	6.693E-2	8.672E-2	9.550E-2	1.345E-1
Average+3σ (Bias2)	---	1.848E-1	5.215E-2	-1.855E-1	-7.406E-1
Average-3σ (Bias2)	---	-2.168E-1	-4.682E-1	-7.585E-1	-1.547E+0

190 MeV proton / detailed results

9. TF1

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ib=0



190 MeV proton / detailed results

TF1 . (µs) **Max = 25.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	2.32	2.32	2.28	2.36	2.32
N° 2 (Bias1)	2.72	2.68	2.64	2.72	2.52
N° 3 (Bias1)	2.24	2.32	2.20	2.20	2.16
N° 4 (Bias1)	2.44	2.48	2.56	2.44	2.28
N° 5 (Bias1)	2.40	2.44	2.36	2.44	2.44
N° 6 (Bias1)	2.20	2.24	2.36	2.28	2.16
N° 7 (Bias2)	2.48	2.52	2.56	2.48	2.44
N° 8 (Bias2)	2.24	2.28	2.32	2.32	2.40
N° 9 (Bias2)	2.40	2.52	2.40	2.44	2.52
N° 10 (Bias2)	2.28	2.32	2.28	2.32	2.32
N° 11 (Bias2)	2.20	2.32	2.28	2.36	2.16
N° 12 (OFF)	2.32	2.44	2.40	2.32	2.72
N° 13 (OFF)	2.32	2.36	2.36	2.24	2.60
N° 14 (OFF)	2.40	2.52	2.56	2.48	2.88
N° 15 (OFF)	2.32	2.40	2.36	2.36	2.64
N° 16 (OFF)	2.28	2.40	2.44	2.32	2.76

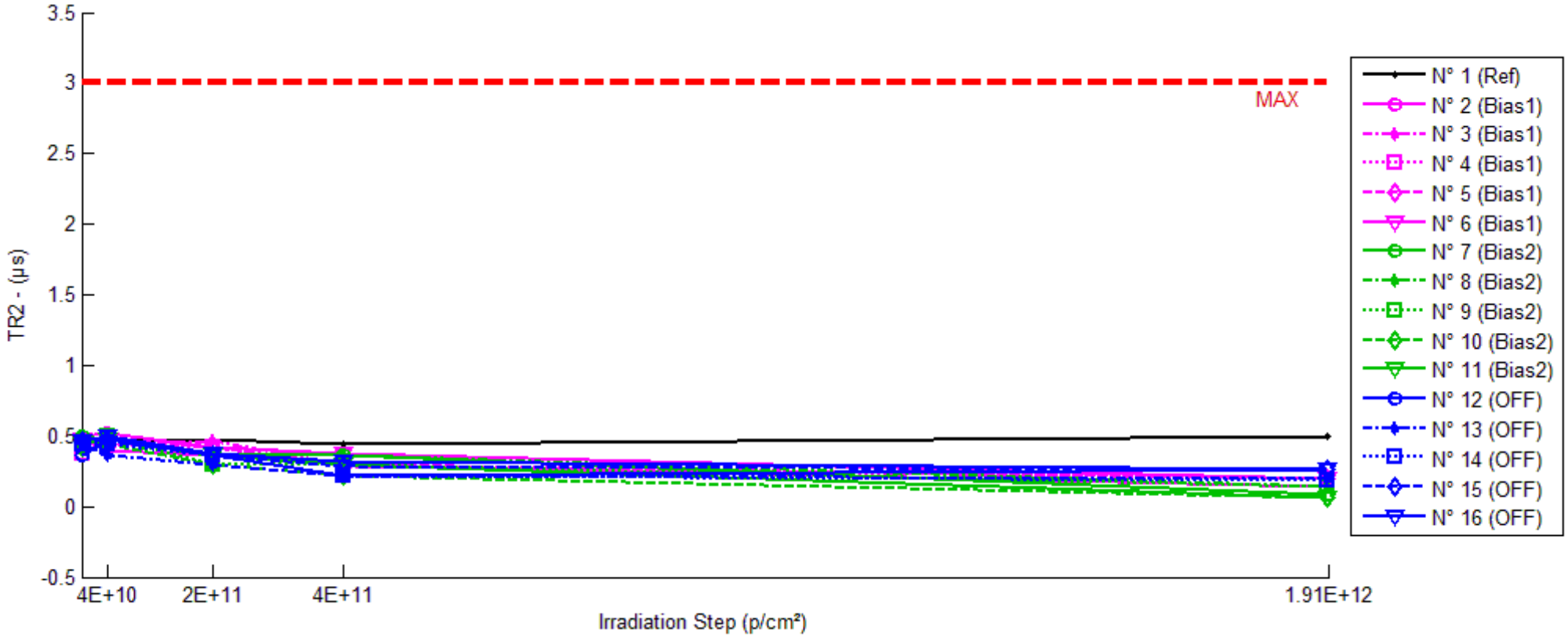
Delta [TF1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	0.000E+0	-4.000E-2	4.000E-2	0.000E+0
N° 2 (Bias1)	---	-4.000E-2	-8.000E-2	0.000E+0	-2.000E-1
N° 3 (Bias1)	---	8.000E-2	-4.000E-2	-4.000E-2	-8.000E-2
N° 4 (Bias1)	---	4.000E-2	1.200E-1	0.000E+0	-1.600E-1
N° 5 (Bias1)	---	4.000E-2	-4.000E-2	4.000E-2	4.000E-2
N° 6 (Bias1)	---	4.000E-2	1.600E-1	8.000E-2	-4.000E-2
N° 7 (Bias2)	---	4.000E-2	8.000E-2	0.000E+0	-4.000E-2
N° 8 (Bias2)	---	4.000E-2	8.000E-2	8.000E-2	1.600E-1
N° 9 (Bias2)	---	1.200E-1	0.000E+0	4.000E-2	1.200E-1
N° 10 (Bias2)	---	4.000E-2	0.000E+0	4.000E-2	4.000E-2
N° 11 (Bias2)	---	1.200E-1	8.000E-2	1.600E-1	-4.000E-2
N° 12 (OFF)	---	1.200E-1	8.000E-2	0.000E+0	4.000E-1
N° 13 (OFF)	---	4.000E-2	4.000E-2	-8.000E-2	2.800E-1
N° 14 (OFF)	---	1.200E-1	1.600E-1	8.000E-2	4.800E-1
N° 15 (OFF)	---	8.000E-2	4.000E-2	4.000E-2	3.200E-1
N° 16 (OFF)	---	1.200E-1	1.600E-1	4.000E-2	4.800E-1
Average (OFF)	---	3.200E-2	2.400E-2	1.600E-2	-8.800E-2
σ (OFF)	---	4.382E-2	1.081E-1	4.561E-2	9.550E-2
Average+3σ (OFF)	---	1.635E-1	3.482E-1	1.528E-1	1.985E-1
Average-3σ (OFF)	---	-9.945E-2	-3.002E-1	-1.208E-1	-3.745E-1
Average (Bias1)	---	7.200E-2	4.800E-2	6.400E-2	4.800E-2
σ (Bias1)	---	4.382E-2	4.382E-2	6.066E-2	9.121E-2
Average+3σ (Bias1)	---	2.035E-1	1.795E-1	2.460E-1	3.216E-1
Average-3σ (Bias1)	---	-5.945E-2	-8.345E-2	-1.180E-1	-2.256E-1
Average (Bias2)	---	9.600E-2	9.600E-2	1.600E-2	3.920E-1
σ (Bias2)	---	3.578E-2	6.066E-2	6.066E-2	9.121E-2
Average+3σ (Bias2)	---	2.033E-1	2.780E-1	1.980E-1	6.656E-1
Average-3σ (Bias2)	---	-1.133E-2	-8.599E-2	-1.660E-1	1.184E-1

190 MeV proton / detailed results

10.TR2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



190 MeV proton / detailed results

TR2 . (µs) **Max = 3.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.50	0.46	0.48	0.44	0.50
N° 2 (Bias1)	0.50	0.52	0.42	0.38	0.20
N° 3 (Bias1)	0.46	0.44	0.46	0.30	0.14
N° 4 (Bias1)	0.38	0.44	0.42	0.28	0.20
N° 5 (Bias1)	0.44	0.48	0.42	0.30	0.20
N° 6 (Bias1)	0.48	0.40	0.36	0.38	0.20
N° 7 (Bias2)	0.50	0.48	0.36	0.36	0.08
N° 8 (Bias2)	0.44	0.44	0.36	0.36	0.14
N° 9 (Bias2)	0.44	0.50	0.30	0.30	0.14
N° 10 (Bias2)	0.42	0.44	0.30	0.22	0.06
N° 11 (Bias2)	0.44	0.48	0.36	0.30	0.06
N° 12 (OFF)	0.36	0.48	0.36	0.22	0.26
N° 13 (OFF)	0.44	0.36	0.30	0.22	0.20
N° 14 (OFF)	0.44	0.44	0.36	0.22	0.18
N° 15 (OFF)	0.46	0.46	0.36	0.28	0.26
N° 16 (OFF)	0.46	0.50	0.38	0.32	0.26

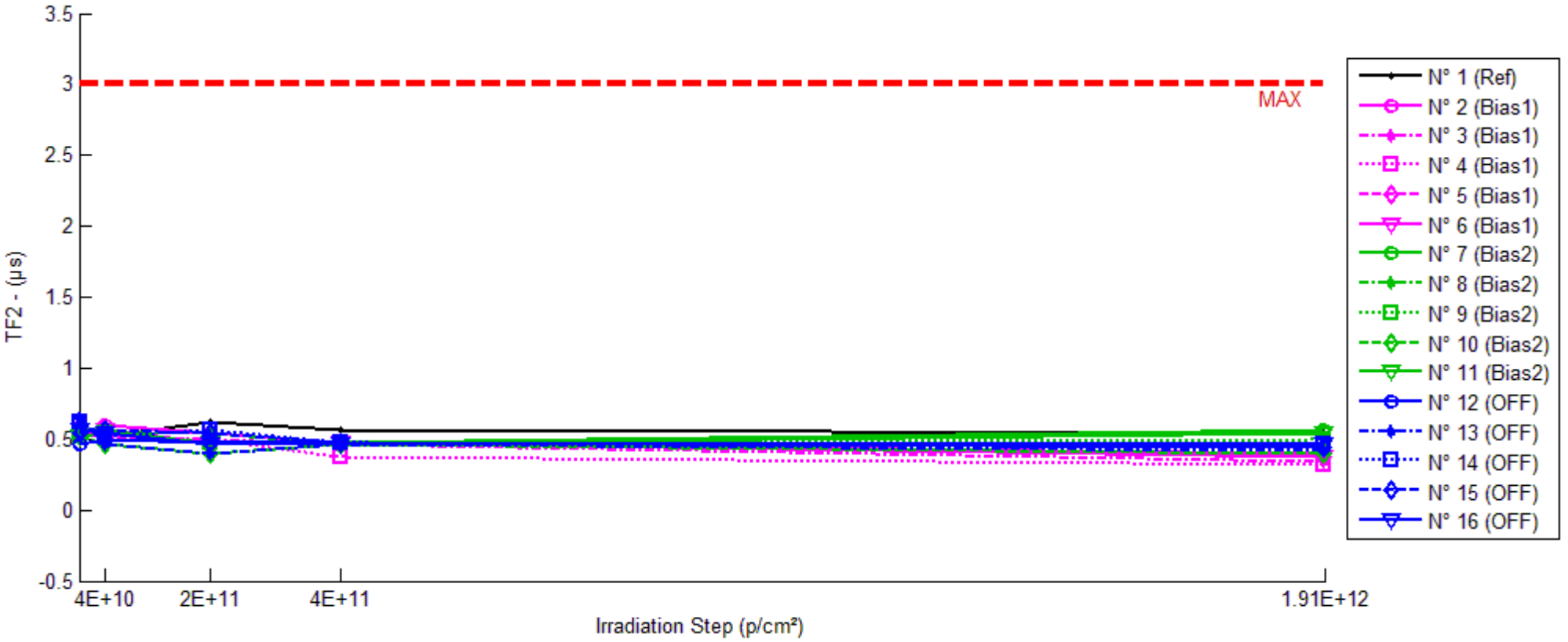
Delta [TR2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-4.000E-2	-2.000E-2	-6.000E-2	0.000E+0
N° 2 (Bias1)	---	2.000E-2	-8.000E-2	-1.200E-1	-3.000E-1
N° 3 (Bias1)	---	-2.000E-2	0.000E+0	-1.600E-1	-3.200E-1
N° 4 (Bias1)	---	6.000E-2	4.000E-2	-1.000E-1	-1.800E-1
N° 5 (Bias1)	---	4.000E-2	-2.000E-2	-1.400E-1	-2.400E-1
N° 6 (Bias1)	---	-8.000E-2	-1.200E-1	-1.000E-1	-2.800E-1
N° 7 (Bias2)	---	-2.000E-2	-1.400E-1	-1.400E-1	-4.200E-1
N° 8 (Bias2)	---	0.000E+0	-8.000E-2	-8.000E-2	-3.000E-1
N° 9 (Bias2)	---	6.000E-2	-1.400E-1	-1.400E-1	-3.000E-1
N° 10 (Bias2)	---	2.000E-2	-1.200E-1	-2.000E-1	-3.600E-1
N° 11 (Bias2)	---	4.000E-2	-8.000E-2	-1.400E-1	-3.800E-1
N° 12 (OFF)	---	1.200E-1	0.000E+0	-1.400E-1	-1.000E-1
N° 13 (OFF)	---	-8.000E-2	-1.400E-1	-2.200E-1	-2.400E-1
N° 14 (OFF)	---	0.000E+0	-8.000E-2	-2.200E-1	-2.600E-1
N° 15 (OFF)	---	0.000E+0	-1.000E-1	-1.800E-1	-2.000E-1
N° 16 (OFF)	---	4.000E-2	-8.000E-2	-1.400E-1	-2.000E-1
Average (OFF)	---	4.000E-3	-3.600E-2	-1.240E-1	-2.640E-1
σ (OFF)	---	5.550E-2	6.387E-2	2.608E-2	5.550E-2
Average+3σ (OFF)	---	1.705E-1	1.556E-1	-4.577E-2	-9.751E-2
Average-3σ (OFF)	---	-1.625E-1	-2.276E-1	-2.022E-1	-4.305E-1
Average (Bias1)	---	2.000E-2	-1.120E-1	-1.400E-1	-3.520E-1
σ (Bias1)	---	3.162E-2	3.033E-2	4.243E-2	5.215E-2
Average+3σ (Bias1)	---	1.149E-1	-2.101E-2	-1.272E-2	-1.955E-1
Average-3σ (Bias1)	---	-7.487E-2	-2.030E-1	-2.673E-1	-5.085E-1
Average (Bias2)	---	1.600E-2	-8.000E-2	-1.800E-1	-2.000E-1
σ (Bias2)	---	7.266E-2	5.099E-2	4.000E-2	6.164E-2
Average+3σ (Bias2)	---	2.340E-1	7.297E-2	-6.000E-2	-1.507E-2
Average-3σ (Bias2)	---	-2.020E-1	-2.330E-1	-3.000E-1	-3.849E-1

190 MeV proton / detailed results

11.TF2

Ta=25°C; Vcc=10V; If=5mA; RL=100 Ohms; Ie=0



190 MeV proton / detailed results

TF2 . (µs) **Max = 3.0**

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	0.56	0.52	0.62	0.56	0.54
N° 2 (Bias1)	0.54	0.60	0.54	0.48	0.40
N° 3 (Bias1)	0.54	0.52	0.50	0.46	0.34
N° 4 (Bias1)	0.56	0.52	0.50	0.38	0.32
N° 5 (Bias1)	0.52	0.52	0.48	0.48	0.38
N° 6 (Bias1)	0.52	0.56	0.48	0.48	0.38
N° 7 (Bias2)	0.56	0.56	0.46	0.48	0.56
N° 8 (Bias2)	0.54	0.54	0.54	0.46	0.46
N° 9 (Bias2)	0.52	0.54	0.48	0.48	0.50
N° 10 (Bias2)	0.52	0.46	0.40	0.46	0.40
N° 11 (Bias2)	0.52	0.54	0.48	0.46	0.54
N° 12 (OFF)	0.46	0.50	0.48	0.48	0.44
N° 13 (OFF)	0.64	0.46	0.40	0.46	0.42
N° 14 (OFF)	0.62	0.52	0.56	0.48	0.46
N° 15 (OFF)	0.54	0.56	0.54	0.48	0.44
N° 16 (OFF)	0.56	0.54	0.46	0.46	0.46

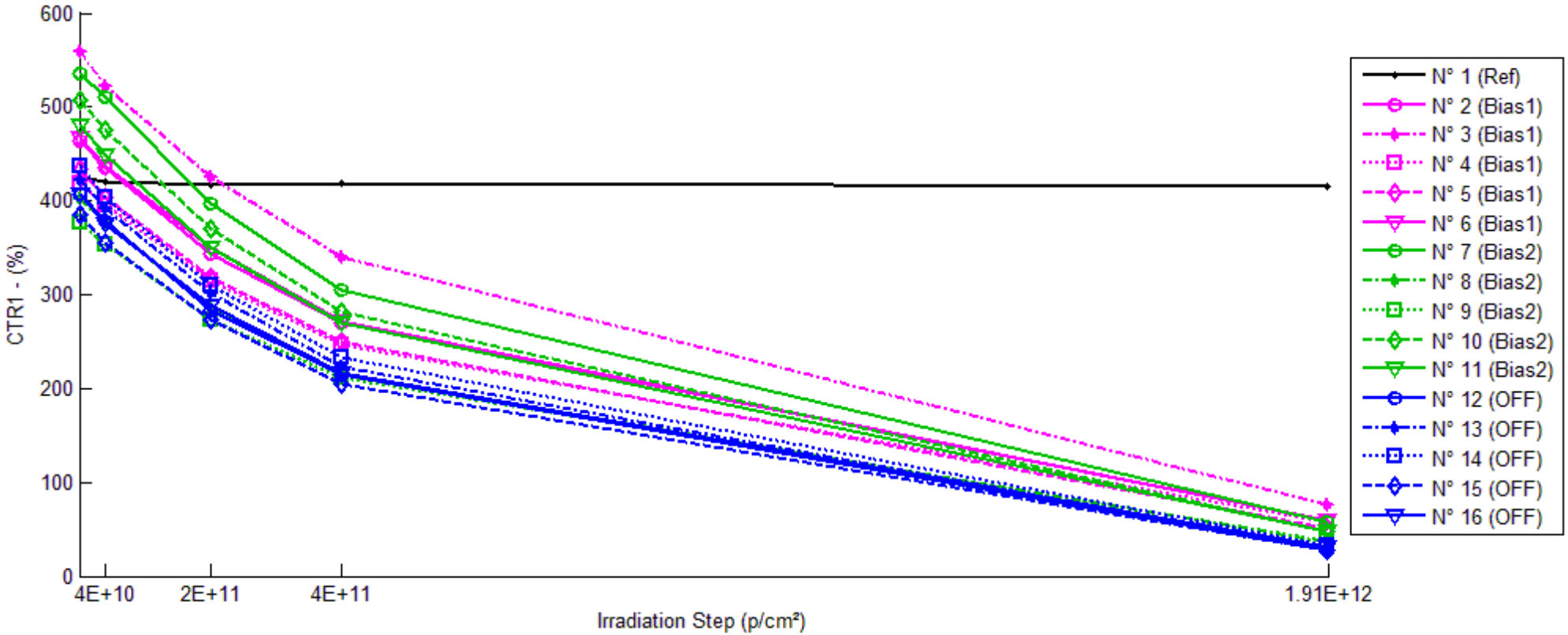
Delta [TF2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-4.000E-2	6.000E-2	0.000E+0	-2.000E-2
N° 2 (Bias1)	---	6.000E-2	0.000E+0	-6.000E-2	-1.400E-1
N° 3 (Bias1)	---	-2.000E-2	-4.000E-2	-8.000E-2	-2.000E-1
N° 4 (Bias1)	---	-4.000E-2	-6.000E-2	-1.800E-1	-2.400E-1
N° 5 (Bias1)	---	0.000E+0	-4.000E-2	-4.000E-2	-1.400E-1
N° 6 (Bias1)	---	4.000E-2	-4.000E-2	-4.000E-2	-1.400E-1
N° 7 (Bias2)	---	0.000E+0	-1.000E-1	-8.000E-2	0.000E+0
N° 8 (Bias2)	---	0.000E+0	0.000E+0	-8.000E-2	-8.000E-2
N° 9 (Bias2)	---	2.000E-2	-4.000E-2	-4.000E-2	-2.000E-2
N° 10 (Bias2)	---	-6.000E-2	-1.200E-1	-6.000E-2	-1.200E-1
N° 11 (Bias2)	---	2.000E-2	-4.000E-2	-6.000E-2	2.000E-2
N° 12 (OFF)	---	4.000E-2	2.000E-2	2.000E-2	-2.000E-2
N° 13 (OFF)	---	-1.800E-1	-2.400E-1	-1.800E-1	-2.200E-1
N° 14 (OFF)	---	-1.000E-1	-6.000E-2	-1.400E-1	-1.600E-1
N° 15 (OFF)	---	2.000E-2	0.000E+0	-6.000E-2	-1.000E-1
N° 16 (OFF)	---	-2.000E-2	-1.000E-1	-1.000E-1	-1.000E-1
Average (OFF)	---	8.000E-3	-3.600E-2	-8.000E-2	-1.720E-1
σ (OFF)	---	4.147E-2	2.191E-2	5.831E-2	4.604E-2
Average+3σ (OFF)	---	1.324E-1	2.973E-2	9.493E-2	-3.387E-2
Average-3σ (OFF)	---	-1.164E-1	-1.017E-1	-2.549E-1	-3.101E-1
Average (Bias1)	---	-4.000E-3	-6.000E-2	-6.400E-2	-4.000E-2
σ (Bias1)	---	3.286E-2	4.899E-2	1.673E-2	5.831E-2
Average+3σ (Bias1)	---	9.459E-2	8.697E-2	-1.380E-2	1.349E-1
Average-3σ (Bias1)	---	-1.026E-1	-2.070E-1	-1.142E-1	-2.149E-1
Average (Bias2)	---	-4.800E-2	-7.600E-2	-9.200E-2	-1.200E-1
σ (Bias2)	---	9.121E-2	1.033E-1	7.694E-2	7.483E-2
Average+3σ (Bias2)	---	2.256E-1	2.340E-1	1.388E-1	1.045E-1
Average-3σ (Bias2)	---	-3.216E-1	-3.860E-1	-3.228E-1	-3.445E-1

190 MeV proton / detailed results

12.CTR1

Ta=25°C; Vce=5V; If=1mA



190 MeV proton / detailed results

CTR1 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	425.86	421.16	416.79	418.25	415.43
N° 2 (Bias1)	464.24	435.53	343.27	269.98	59.57
N° 3 (Bias1)	558.43	521.97	425.84	339.75	76.29
N° 4 (Bias1)	418.84	395.00	314.59	247.15	57.46
N° 5 (Bias1)	433.28	402.80	318.23	249.08	51.49
N° 6 (Bias1)	466.62	436.94	349.42	271.96	59.58
N° 7 (Bias2)	536.37	509.90	396.32	304.88	57.87
N° 8 (Bias2)	401.71	377.29	284.97	215.49	35.93
N° 9 (Bias2)	377.26	352.69	272.83	211.61	37.17
N° 10 (Bias2)	507.59	475.41	369.65	282.22	48.31
N° 11 (Bias2)	481.27	449.23	350.04	269.12	47.83
N° 12 (OFF)	407.76	378.44	283.04	215.17	26.84
N° 13 (OFF)	422.55	392.65	301.05	222.63	29.11
N° 14 (OFF)	436.99	403.92	310.24	233.81	31.79
N° 15 (OFF)	385.84	354.73	272.99	204.30	26.85
N° 16 (OFF)	407.27	375.15	288.75	216.02	30.90

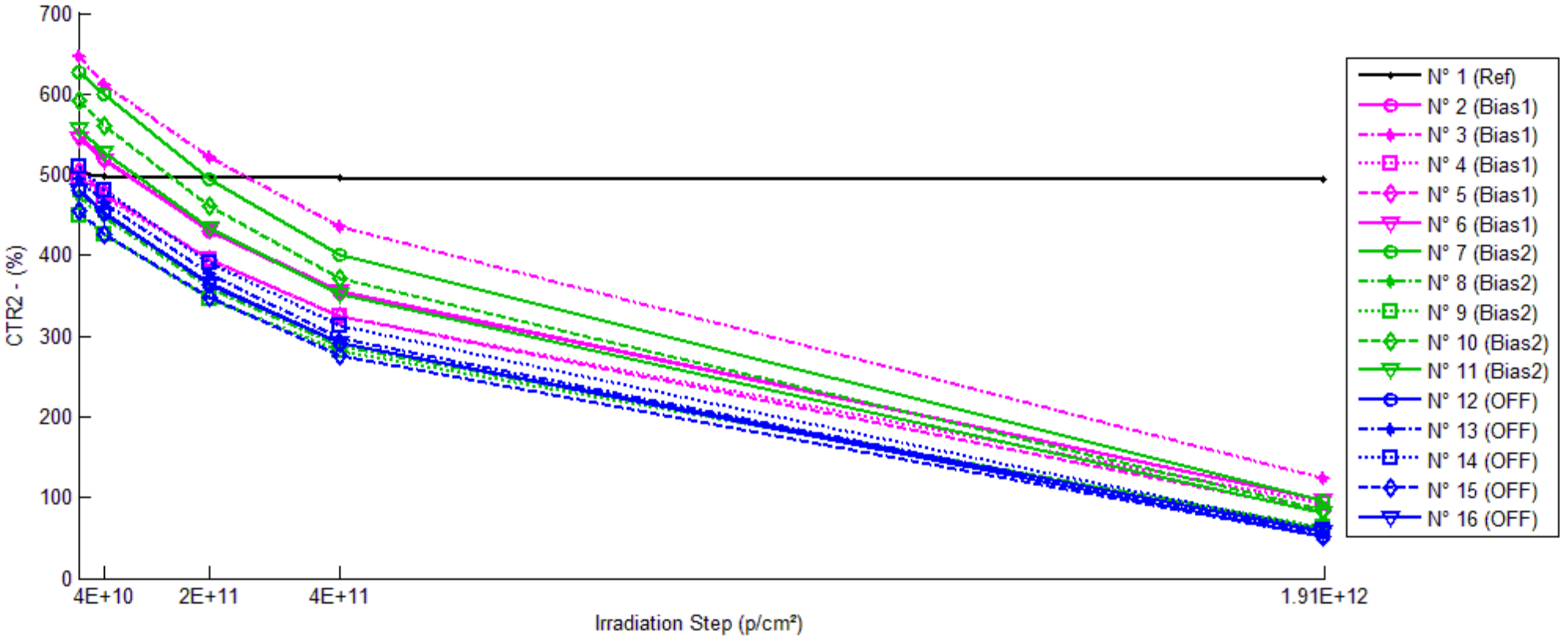
1/Delta [CTR1]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.620E-5	5.107E-5	4.273E-5	5.895E-5
N° 2 (Bias1)	---	1.420E-4	7.591E-4	1.550E-3	1.463E-2
N° 3 (Bias1)	---	1.251E-4	5.576E-4	1.153E-3	1.132E-2
N° 4 (Bias1)	---	1.441E-4	7.912E-4	1.659E-3	1.502E-2
N° 5 (Bias1)	---	1.746E-4	8.344E-4	1.707E-3	1.711E-2
N° 6 (Bias1)	---	1.456E-4	7.188E-4	1.534E-3	1.464E-2
N° 7 (Bias2)	---	9.680E-5	6.588E-4	1.416E-3	1.542E-2
N° 8 (Bias2)	---	1.611E-4	1.020E-3	2.151E-3	2.534E-2
N° 9 (Bias2)	---	1.846E-4	1.015E-3	2.075E-3	2.426E-2
N° 10 (Bias2)	---	1.333E-4	7.352E-4	1.573E-3	1.873E-2
N° 11 (Bias2)	---	1.482E-4	7.790E-4	1.638E-3	1.883E-2
N° 12 (OFF)	---	1.900E-4	1.081E-3	2.195E-3	3.481E-2
N° 13 (OFF)	---	1.802E-4	9.551E-4	2.125E-3	3.199E-2
N° 14 (OFF)	---	1.874E-4	9.349E-4	1.989E-3	2.917E-2
N° 15 (OFF)	---	2.273E-4	1.071E-3	2.303E-3	3.465E-2
N° 16 (OFF)	---	2.103E-4	1.008E-3	2.174E-3	2.991E-2
Average (OFF)	---	1.463E-4	7.322E-4	1.520E-3	1.454E-2
σ (OFF)	---	1.787E-5	1.064E-4	2.181E-4	2.076E-3
Average+3σ (OFF)	---	1.999E-4	1.052E-3	2.175E-3	2.077E-2
Average-3σ (OFF)	---	9.265E-5	4.128E-4	8.662E-4	8.315E-3
Average (Bias1)	---	1.448E-4	8.415E-4	1.771E-3	2.051E-2
σ (Bias1)	---	3.278E-5	1.661E-4	3.240E-4	4.164E-3
Average+3σ (Bias1)	---	2.431E-4	1.340E-3	2.743E-3	3.301E-2
Average-3σ (Bias1)	---	4.647E-5	3.432E-4	7.985E-4	8.023E-3
Average (Bias2)	---	1.990E-4	1.010E-3	2.157E-3	3.211E-2
σ (Bias2)	---	1.935E-5	6.598E-5	1.145E-4	2.610E-3
Average+3σ (Bias2)	---	2.571E-4	1.208E-3	2.501E-3	3.994E-2
Average-3σ (Bias2)	---	1.410E-4	8.120E-4	1.814E-3	2.428E-2

190 MeV proton / detailed results

13.CTR2

Ta=25°C; Vce=5V; If=2mA



190 MeV proton / detailed results

CTR2 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	501.99	498.56	495.55	497.02	495.26
N° 2 (Bias1)	548.56	519.60	430.56	354.57	96.81
N° 3 (Bias1)	645.77	611.65	522.08	435.47	123.34
N° 4 (Bias1)	495.78	471.97	393.89	323.88	93.39
N° 5 (Bias1)	504.88	476.53	394.74	324.16	83.80
N° 6 (Bias1)	544.53	516.82	432.53	355.39	97.34
N° 7 (Bias2)	626.26	598.72	494.09	400.93	96.84
N° 8 (Bias2)	473.36	448.18	360.05	287.91	61.94
N° 9 (Bias2)	449.20	425.40	346.93	281.88	63.23
N° 10 (Bias2)	591.08	560.84	460.67	371.70	83.98
N° 11 (Bias2)	556.23	527.20	433.80	351.16	81.15
N° 12 (OFF)	480.84	453.32	364.22	291.23	52.44
N° 13 (OFF)	493.36	464.86	377.62	297.27	54.68
N° 14 (OFF)	510.25	480.15	391.31	312.31	59.49
N° 15 (OFF)	455.33	426.45	347.84	276.42	50.70
N° 16 (OFF)	480.61	451.16	366.44	290.77	57.23

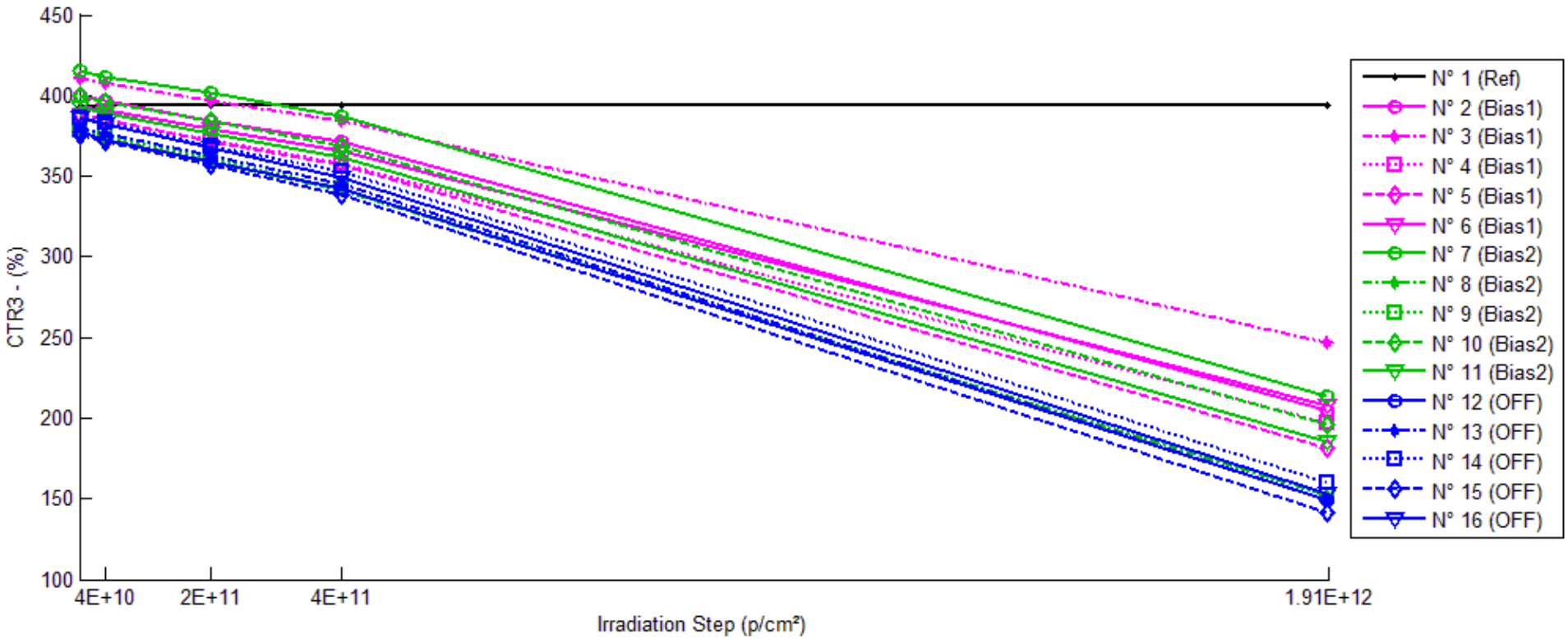
1/Delta [CTR2]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	1.372E-5	2.587E-5	1.993E-5	2.707E-5
N° 2 (Bias1)	---	1.016E-4	4.996E-4	9.974E-4	8.506E-3
N° 3 (Bias1)	---	8.637E-5	3.669E-4	7.478E-4	6.559E-3
N° 4 (Bias1)	---	1.018E-4	5.217E-4	1.071E-3	8.690E-3
N° 5 (Bias1)	---	1.178E-4	5.526E-4	1.104E-3	9.952E-3
N° 6 (Bias1)	---	9.848E-5	4.755E-4	9.774E-4	8.437E-3
N° 7 (Bias2)	---	7.345E-5	4.272E-4	8.974E-4	8.730E-3
N° 8 (Bias2)	---	1.187E-4	6.649E-4	1.361E-3	1.403E-2
N° 9 (Bias2)	---	1.245E-4	6.563E-4	1.321E-3	1.359E-2
N° 10 (Bias2)	---	9.123E-5	4.789E-4	9.985E-4	1.022E-2
N° 11 (Bias2)	---	9.900E-5	5.074E-4	1.050E-3	1.052E-2
N° 12 (OFF)	---	1.263E-4	6.659E-4	1.354E-3	1.699E-2
N° 13 (OFF)	---	1.243E-4	6.212E-4	1.337E-3	1.626E-2
N° 14 (OFF)	---	1.229E-4	5.957E-4	1.242E-3	1.485E-2
N° 15 (OFF)	---	1.487E-4	6.787E-4	1.421E-3	1.753E-2
N° 16 (OFF)	---	1.358E-4	6.483E-4	1.359E-3	1.539E-2
Average (OFF)	---	1.012E-4	4.833E-4	9.795E-4	8.429E-3
σ (OFF)	---	1.123E-5	7.101E-5	1.395E-4	1.213E-3
Average+3σ (OFF)	---	1.349E-4	6.963E-4	1.398E-3	1.207E-2
Average-3σ (OFF)	---	6.753E-5	2.703E-4	5.610E-4	4.789E-3
Average (Bias1)	---	1.014E-4	5.469E-4	1.126E-3	1.142E-2
σ (Bias1)	---	2.076E-5	1.077E-4	2.047E-4	2.293E-3
Average+3σ (Bias1)	---	1.637E-4	8.700E-4	1.740E-3	1.830E-2
Average-3σ (Bias1)	---	3.910E-5	2.238E-4	5.116E-4	4.541E-3
Average (Bias2)	---	1.316E-4	6.419E-4	1.343E-3	1.620E-2
σ (Bias2)	---	1.083E-5	3.366E-5	6.468E-5	1.103E-3
Average+3σ (Bias2)	---	1.641E-4	7.429E-4	1.537E-3	1.951E-2
Average-3σ (Bias2)	---	9.909E-5	5.410E-4	1.149E-3	1.290E-2

190 MeV proton / detailed results

14.CTR3

Ta=25°C; Vce=5V; If=10mA



190 MeV proton / detailed results

CTR3 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	393.39	393.67	394.19	394.35	393.81
N° 2 (Bias1)	399.69	396.84	384.43	371.21	204.80
N° 3 (Bias1)	410.52	407.49	397.08	384.56	246.39
N° 4 (Bias1)	387.00	384.39	372.06	357.46	197.27
N° 5 (Bias1)	388.14	384.84	371.67	356.76	181.07
N° 6 (Bias1)	393.33	391.16	379.13	365.34	207.26
N° 7 (Bias2)	415.79	411.95	401.33	386.82	213.16
N° 8 (Bias2)	376.92	373.63	359.03	341.33	151.68
N° 9 (Bias2)	378.65	375.09	360.72	341.86	152.54
N° 10 (Bias2)	399.60	396.17	383.81	368.83	196.42
N° 11 (Bias2)	392.57	388.91	376.70	361.48	185.59
N° 12 (OFF)	377.36	372.66	358.36	342.44	149.60
N° 13 (OFF)	380.61	376.58	362.27	345.09	149.62
N° 14 (OFF)	386.50	382.77	368.62	352.83	159.52
N° 15 (OFF)	375.85	371.61	356.82	338.65	141.23
N° 16 (OFF)	386.52	382.21	367.28	349.23	153.18

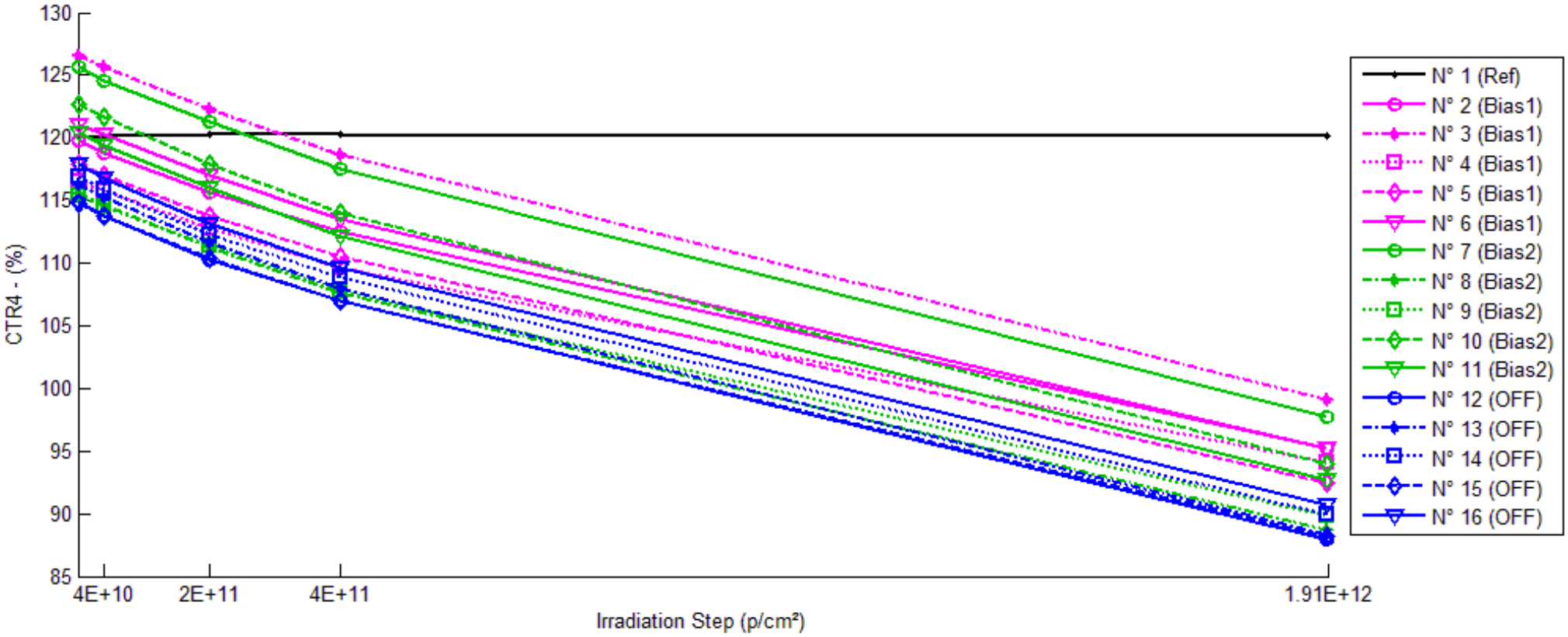
1/Delta [CTR3]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.857E-6	-5.212E-6	-6.206E-6	-2.749E-6
N° 2 (Bias1)	---	1.797E-5	9.930E-5	1.920E-4	2.381E-3
N° 3 (Bias1)	---	1.807E-5	8.246E-5	1.644E-4	1.623E-3
N° 4 (Bias1)	---	1.754E-5	1.038E-4	2.135E-4	2.485E-3
N° 5 (Bias1)	---	2.210E-5	1.142E-4	2.266E-4	2.946E-3
N° 6 (Bias1)	---	1.407E-5	9.521E-5	1.947E-4	2.282E-3
N° 7 (Bias2)	---	2.244E-5	8.668E-5	1.802E-4	2.286E-3
N° 8 (Bias2)	---	2.335E-5	1.322E-4	2.767E-4	3.940E-3
N° 9 (Bias2)	---	2.504E-5	1.313E-4	2.842E-4	3.915E-3
N° 10 (Bias2)	---	2.167E-5	1.030E-4	2.088E-4	2.589E-3
N° 11 (Bias2)	---	2.397E-5	1.073E-4	2.191E-4	2.841E-3
N° 12 (OFF)	---	3.338E-5	1.405E-4	2.702E-4	4.034E-3
N° 13 (OFF)	---	2.816E-5	1.330E-4	2.704E-4	4.056E-3
N° 14 (OFF)	---	2.524E-5	1.255E-4	2.469E-4	3.681E-3
N° 15 (OFF)	---	3.038E-5	1.419E-4	2.923E-4	4.420E-3
N° 16 (OFF)	---	2.917E-5	1.356E-4	2.763E-4	3.941E-3
Average (OFF)	---	1.795E-5	9.899E-5	1.983E-4	2.343E-3
σ (OFF)	---	2.846E-6	1.164E-5	2.362E-5	4.766E-4
Average+3σ (OFF)	---	2.649E-5	1.339E-4	2.691E-4	3.773E-3
Average-3σ (OFF)	---	9.413E-6	6.407E-5	1.274E-4	9.138E-4
Average (Bias1)	---	2.330E-5	1.121E-4	2.338E-4	3.114E-3
σ (Bias1)	---	1.310E-6	1.952E-5	4.499E-5	7.680E-4
Average+3σ (Bias1)	---	2.723E-5	1.707E-4	3.687E-4	5.418E-3
Average-3σ (Bias1)	---	1.937E-5	5.353E-5	9.882E-5	8.101E-4
Average (Bias2)	---	2.927E-5	1.353E-4	2.712E-4	4.027E-3
σ (Bias2)	---	2.983E-6	6.554E-6	1.630E-5	2.657E-4
Average+3σ (Bias2)	---	3.822E-5	1.550E-4	3.201E-4	4.824E-3
Average-3σ (Bias2)	---	2.032E-5	1.156E-4	2.223E-4	3.229E-3

190 MeV proton / detailed results

15.CTR4

Ta=25°C; Vce=5V; If=50mA



190 MeV proton / detailed results

CTR4 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	120.03	120.12	120.27	120.30	120.18
N° 2 (Bias1)	119.78	118.84	115.62	112.49	95.19
N° 3 (Bias1)	126.59	125.65	122.27	118.68	99.04
N° 4 (Bias1)	116.47	115.76	112.75	109.66	94.04
N° 5 (Bias1)	117.85	116.99	113.78	110.56	92.47
N° 6 (Bias1)	121.04	120.25	117.02	113.55	95.19
N° 7 (Bias2)	125.72	124.59	121.34	117.54	97.67
N° 8 (Bias2)	115.56	114.70	111.20	107.58	88.69
N° 9 (Bias2)	115.39	114.55	111.34	107.76	89.86
N° 10 (Bias2)	122.66	121.63	117.93	114.04	93.99
N° 11 (Bias2)	120.46	119.45	115.97	112.19	92.74
N° 12 (OFF)	114.92	113.73	110.23	106.98	87.96
N° 13 (OFF)	116.30	115.23	111.64	107.95	88.38
N° 14 (OFF)	116.84	115.88	112.31	108.85	89.95
N° 15 (OFF)	114.79	113.77	110.37	107.02	88.15
N° 16 (OFF)	117.90	116.81	113.19	109.63	90.66

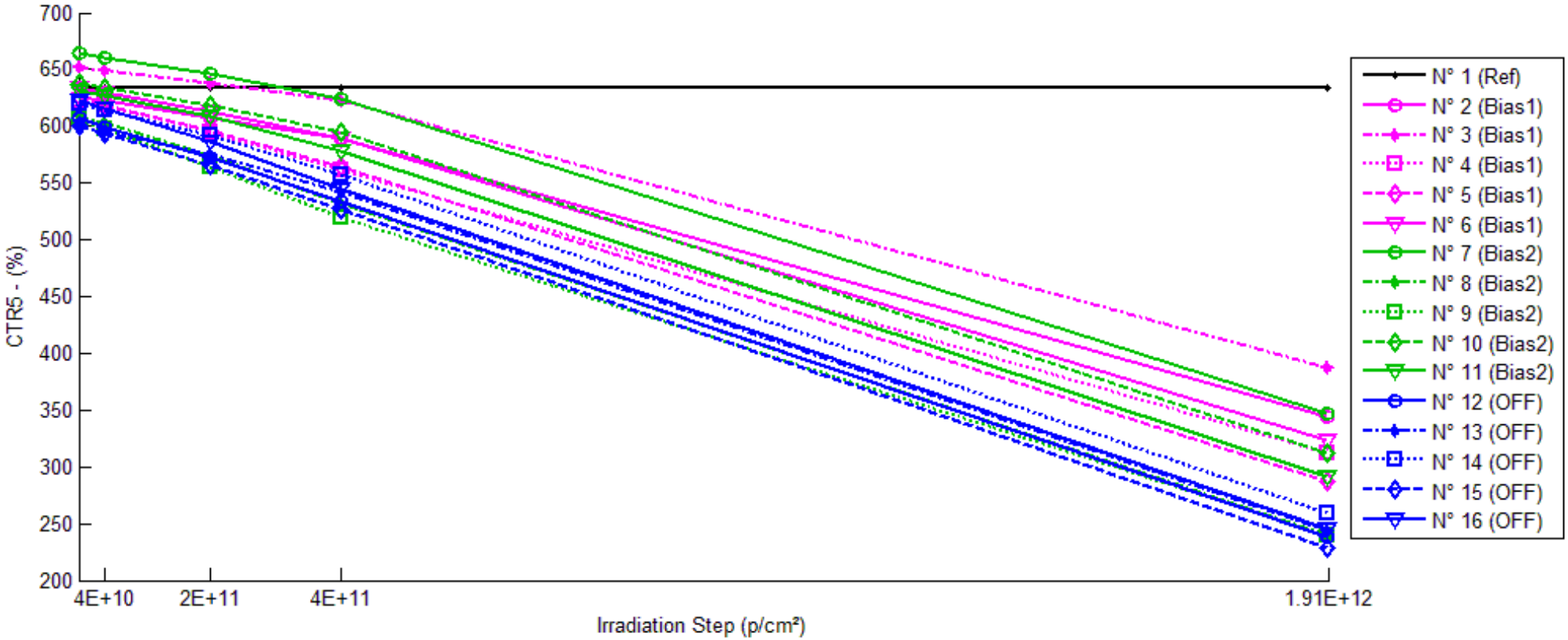
1/Delta [CTR4]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-6.305E-6	-1.684E-5	-1.874E-5	-1.077E-5
N° 2 (Bias1)	---	6.624E-5	3.008E-4	5.416E-4	2.157E-3
N° 3 (Bias1)	---	5.911E-5	2.794E-4	5.265E-4	2.197E-3
N° 4 (Bias1)	---	5.318E-5	2.840E-4	5.337E-4	2.049E-3
N° 5 (Bias1)	---	6.235E-5	3.039E-4	5.593E-4	2.329E-3
N° 6 (Bias1)	---	5.423E-5	2.838E-4	5.455E-4	2.244E-3
N° 7 (Bias2)	---	7.233E-5	2.871E-4	5.538E-4	2.284E-3
N° 8 (Bias2)	---	6.535E-5	3.393E-4	6.421E-4	2.622E-3
N° 9 (Bias2)	---	6.396E-5	3.153E-4	6.136E-4	2.462E-3
N° 10 (Bias2)	---	6.917E-5	3.274E-4	6.162E-4	2.487E-3
N° 11 (Bias2)	---	7.061E-5	3.219E-4	6.120E-4	2.481E-3
N° 12 (OFF)	---	9.082E-5	3.699E-4	6.459E-4	2.667E-3
N° 13 (OFF)	---	7.976E-5	3.590E-4	6.646E-4	2.716E-3
N° 14 (OFF)	---	7.094E-5	3.447E-4	6.283E-4	2.558E-3
N° 15 (OFF)	---	7.799E-5	3.489E-4	6.325E-4	2.633E-3
N° 16 (OFF)	---	7.973E-5	3.530E-4	6.405E-4	2.549E-3
Average (OFF)	---	5.902E-5	2.904E-4	5.413E-4	2.195E-3
σ (OFF)	---	5.484E-6	1.115E-5	1.245E-5	1.040E-4
Average+3σ (OFF)	---	7.547E-5	3.238E-4	5.787E-4	2.507E-3
Average-3σ (OFF)	---	4.257E-5	2.569E-4	5.040E-4	1.883E-3
Average (Bias1)	---	6.828E-5	3.182E-4	6.076E-4	2.467E-3
σ (Bias1)	---	3.530E-6	1.949E-5	3.247E-5	1.206E-4
Average+3σ (Bias1)	---	7.887E-5	3.767E-4	7.050E-4	2.829E-3
Average-3σ (Bias1)	---	5.769E-5	2.597E-4	5.102E-4	2.106E-3
Average (Bias2)	---	7.985E-5	3.551E-4	6.424E-4	2.625E-3
σ (Bias2)	---	7.129E-6	9.816E-6	1.420E-5	7.129E-5
Average+3σ (Bias2)	---	1.012E-4	3.846E-4	6.850E-4	2.839E-3
Average-3σ (Bias2)	---	5.846E-5	3.257E-4	5.998E-4	2.411E-3

190 MeV proton / detailed results

16.CTR5

Ta=25°C; Vce=30V; If=10mA



190 MeV proton / detailed results

CTR5 . (%)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	633.51	633.56	634.13	634.23	633.69
N° 2 (Bias1)	625.84	622.05	607.61	588.70	343.78
N° 3 (Bias1)	652.37	649.71	638.07	623.12	387.10
N° 4 (Bias1)	623.00	618.19	595.03	561.96	312.74
N° 5 (Bias1)	624.53	619.14	596.26	563.67	287.71
N° 6 (Bias1)	633.37	629.85	613.64	588.72	323.73
N° 7 (Bias2)	664.02	659.81	646.12	624.34	346.77
N° 8 (Bias2)	609.39	603.69	574.49	532.26	239.71
N° 9 (Bias2)	605.81	598.11	563.62	519.15	239.19
N° 10 (Bias2)	637.55	633.78	618.58	594.98	312.31
N° 11 (Bias2)	631.42	626.77	608.13	578.13	291.50
N° 12 (OFF)	606.79	599.67	572.57	533.25	238.29
N° 13 (OFF)	599.80	594.78	575.18	541.83	244.31
N° 14 (OFF)	620.49	615.00	591.81	556.67	259.52
N° 15 (OFF)	600.24	593.50	566.22	526.11	228.13
N° 16 (OFF)	622.43	615.39	586.69	544.09	245.29

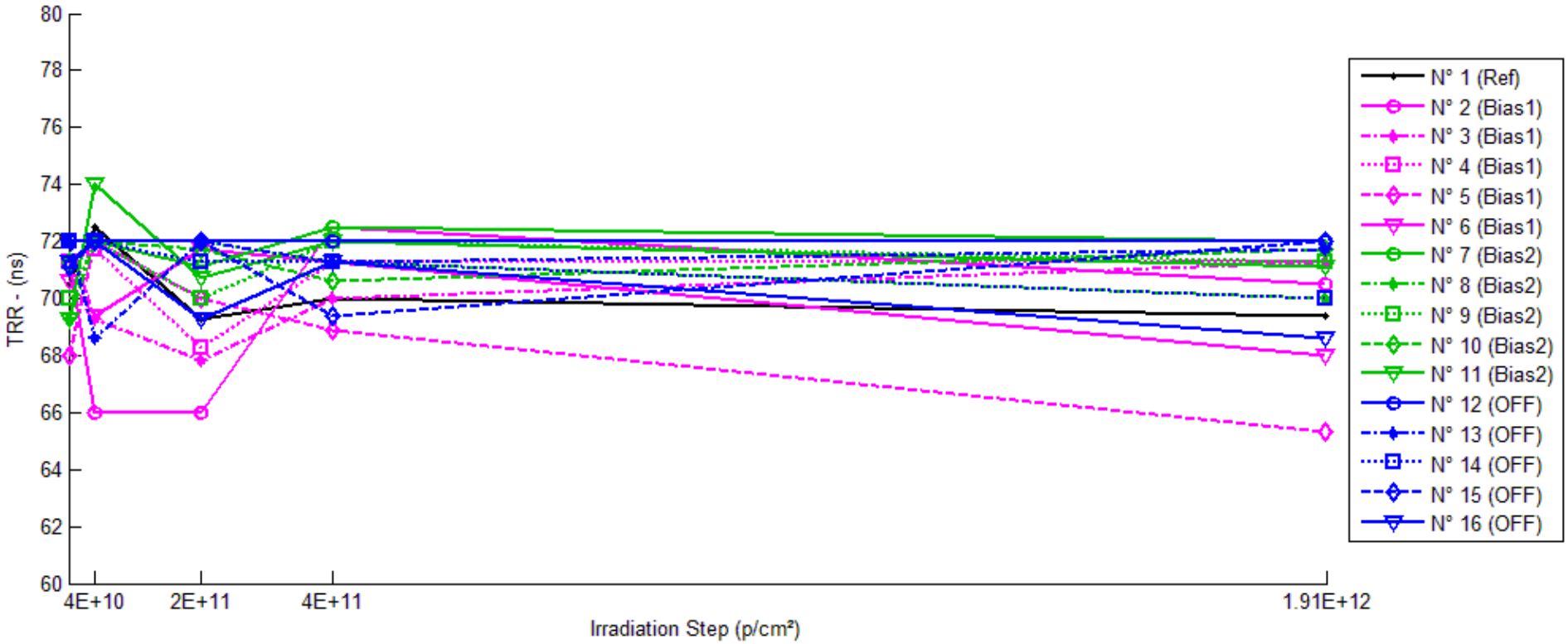
1/Delta [CTR5]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	-1.206E-7	-1.549E-6	-1.789E-6	-4.608E-7
N° 2 (Bias1)	---	9.746E-6	4.795E-5	1.008E-4	1.311E-3
N° 3 (Bias1)	---	6.280E-6	3.437E-5	7.197E-5	1.050E-3
N° 4 (Bias1)	---	1.251E-5	7.547E-5	1.744E-4	1.592E-3
N° 5 (Bias1)	---	1.395E-5	7.592E-5	1.729E-4	1.874E-3
N° 6 (Bias1)	---	8.828E-6	5.078E-5	1.197E-4	1.510E-3
N° 7 (Bias2)	---	9.599E-6	4.172E-5	9.572E-5	1.378E-3
N° 8 (Bias2)	---	1.550E-5	9.968E-5	2.378E-4	2.531E-3
N° 9 (Bias2)	---	2.123E-5	1.236E-4	2.755E-4	2.530E-3
N° 10 (Bias2)	---	9.334E-6	4.811E-5	1.122E-4	1.633E-3
N° 11 (Bias2)	---	1.175E-5	6.066E-5	1.460E-4	1.847E-3
N° 12 (OFF)	---	1.956E-5	9.850E-5	2.273E-4	2.549E-3
N° 13 (OFF)	---	1.409E-5	7.138E-5	1.784E-4	2.426E-3
N° 14 (OFF)	---	1.440E-5	7.810E-5	1.848E-4	2.242E-3
N° 15 (OFF)	---	1.892E-5	1.001E-4	2.347E-4	2.718E-3
N° 16 (OFF)	---	1.838E-5	9.789E-5	2.313E-4	2.470E-3
Average (OFF)	---	1.026E-5	5.690E-5	1.280E-4	1.468E-3
σ (OFF)	---	3.034E-6	1.825E-5	4.503E-5	3.088E-4
Average+3σ (OFF)	---	1.937E-5	1.116E-4	2.631E-4	2.394E-3
Average-3σ (OFF)	---	1.159E-6	2.160E-6	-7.132E-6	5.412E-4
Average (Bias1)	---	1.348E-5	7.475E-5	1.734E-4	1.984E-3
σ (Bias1)	---	4.986E-6	3.537E-5	7.922E-5	5.259E-4
Average+3σ (Bias1)	---	2.844E-5	1.808E-4	4.111E-4	3.562E-3
Average-3σ (Bias1)	---	-1.476E-6	-3.135E-5	-6.420E-5	4.060E-4
Average (Bias2)	---	1.707E-5	8.920E-5	2.113E-4	2.481E-3
σ (Bias2)	---	2.618E-6	1.343E-5	2.735E-5	1.739E-4
Average+3σ (Bias2)	---	2.493E-5	1.295E-4	2.934E-4	3.002E-3
Average-3σ (Bias2)	---	9.217E-6	4.890E-5	1.293E-4	1.959E-3

190 MeV proton / detailed results

17.TRR

Ta=25°C; If = 5mA; RL = 100 Ohms; Irec = 10% Irm



190 MeV proton / detailed results

TRR . (ns)

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	70.5	72.5	69.3	70.0	69.4
N° 2 (Bias1)	71.3	66.0	66.0	72.5	70.5
N° 3 (Bias1)	72.0	69.3	67.8	70.0	71.3
N° 4 (Bias1)	71.3	71.7	68.3	71.3	71.3
N° 5 (Bias1)	68.0	72.0	70.0	68.9	65.3
N° 6 (Bias1)	70.6	69.4	71.7	71.3	68.0
N° 7 (Bias2)	72.0	72.0	71.1	72.5	72.0
N° 8 (Bias2)	69.3	72.0	72.0	71.3	70.0
N° 9 (Bias2)	70.0	72.0	70.0	72.0	71.3
N° 10 (Bias2)	71.3	72.0	71.7	70.6	71.7
N° 11 (Bias2)	69.3	74.0	70.7	72.0	71.1
N° 12 (OFF)	72.0	72.0	72.0	72.0	72.0
N° 13 (OFF)	72.0	68.6	72.0	71.3	71.7
N° 14 (OFF)	72.0	72.0	71.3	71.3	70.0
N° 15 (OFF)	71.1	72.0	72.0	69.4	72.0
N° 16 (OFF)	71.3	72.0	69.3	71.3	68.6

Delta [TRR]

	0.p/cm²	4E10.p/cm²	2E11.p/cm²	4E11.p/cm²	1.91E12.p/cm²
N° 1 (Ref)	---	2.008E+0	-1.185E+0	-4.918E-1	-1.070E+0
N° 2 (Bias1)	---	-5.287E+0	-5.287E+0	1.213E+0	-7.953E-1
N° 3 (Bias1)	---	-2.693E+0	-4.231E+0	-2.000E+0	-7.129E-1
N° 4 (Bias1)	---	3.795E-1	-2.954E+0	0.000E+0	0.000E+0
N° 5 (Bias1)	---	4.000E+0	2.000E+0	8.525E-1	-2.653E+0
N° 6 (Bias1)	---	-1.167E+0	1.078E+0	6.989E-1	-2.588E+0
N° 7 (Bias2)	---	0.000E+0	-9.256E-1	5.000E-1	0.000E+0
N° 8 (Bias2)	---	2.693E+0	2.693E+0	1.980E+0	6.931E-1
N° 9 (Bias2)	---	2.000E+0	0.000E+0	2.000E+0	1.287E+0
N° 10 (Bias2)	---	7.129E-1	3.795E-1	-6.989E-1	3.795E-1
N° 11 (Bias2)	---	4.693E+0	1.425E+0	2.693E+0	1.767E+0
N° 12 (OFF)	---	0.000E+0	0.000E+0	0.000E+0	0.000E+0
N° 13 (OFF)	---	-3.373E+0	0.000E+0	-7.129E-1	-3.333E-1
N° 14 (OFF)	---	0.000E+0	-7.129E-1	-7.129E-1	-2.000E+0
N° 15 (OFF)	---	9.256E-1	9.256E-1	-1.653E+0	9.256E-1
N° 16 (OFF)	---	7.129E-1	-1.980E+0	0.000E+0	-2.660E+0
Average (OFF)	---	-9.535E-1	-1.879E+0	1.528E-1	-1.350E+0
σ (OFF)	---	3.470E+0	3.244E+0	1.282E+0	1.201E+0
Average+3σ (OFF)	---	9.457E+0	7.854E+0	3.997E+0	2.253E+0
Average-3σ (OFF)	---	-1.136E+1	-1.161E+1	-3.692E+0	-4.953E+0
Average (Bias1)	---	2.020E+0	7.144E-1	1.295E+0	8.254E-1
σ (Bias1)	---	1.829E+0	1.390E+0	1.372E+0	7.068E-1
Average+3σ (Bias1)	---	7.508E+0	4.885E+0	5.411E+0	2.946E+0
Average-3σ (Bias1)	---	-3.469E+0	-3.457E+0	-2.821E+0	-1.295E+0
Average (Bias2)	---	-3.468E-1	-3.535E-1	-6.157E-1	-8.135E-1
σ (Bias2)	---	1.742E+0	1.080E+0	6.806E-1	1.478E+0
Average+3σ (Bias2)	---	4.879E+0	2.885E+0	1.426E+0	3.619E+0
Average-3σ (Bias2)	---	-5.573E+0	-3.592E+0	-2.658E+0	-5.246E+0