

LAPPD tests at magnetic fields

Preliminary studies on DCRs

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On behalf of INFN-TS

Activities till now

- Dark counts data are taken care
- Codes prepared
- Some preliminary plots

PAD mapping/detector rotation

HV connectors
 Pad_id
 Axis of rotation (X-axis)

X_0N

X_0X

+ Y/B



1

5



7

9

+ve rotation
 PC/ N_0N / N_0X /Ch 7,8,9 → UP
 X_0N / X_0X /Ch 1,2,3 → Down

1	2	3
4	5	6
7	8	9

Sensor Pad Mapping
 from detector back-end

PC

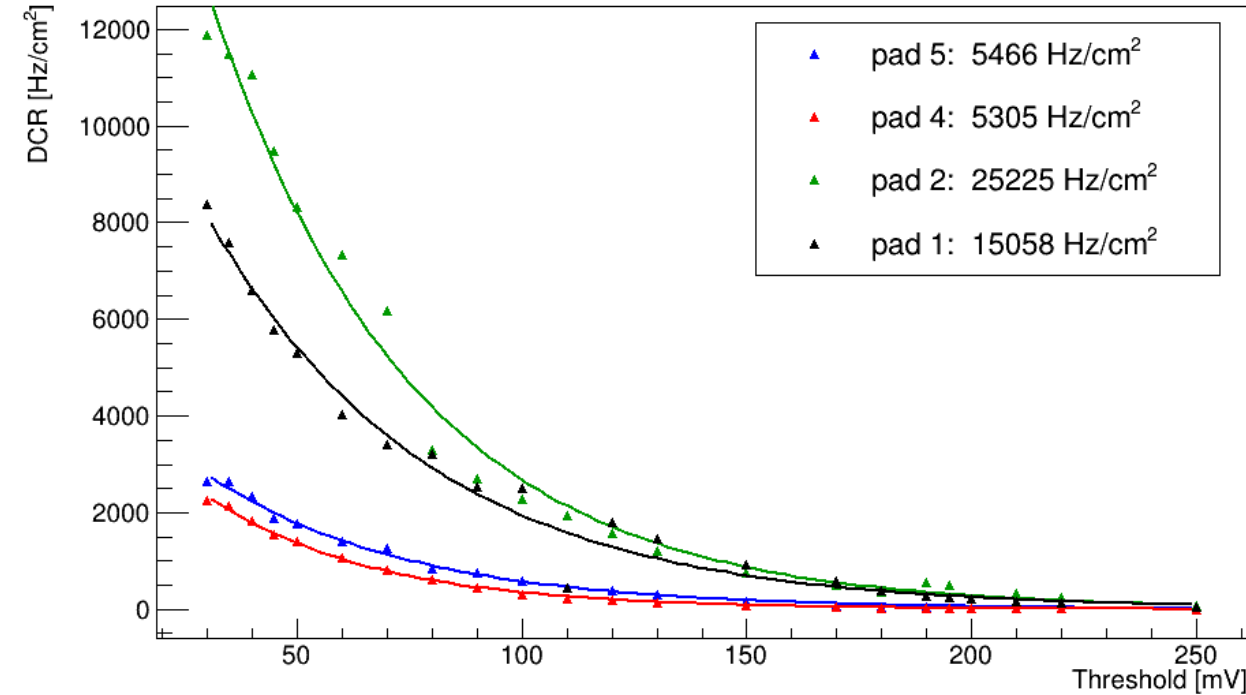
N_0N

N_0X

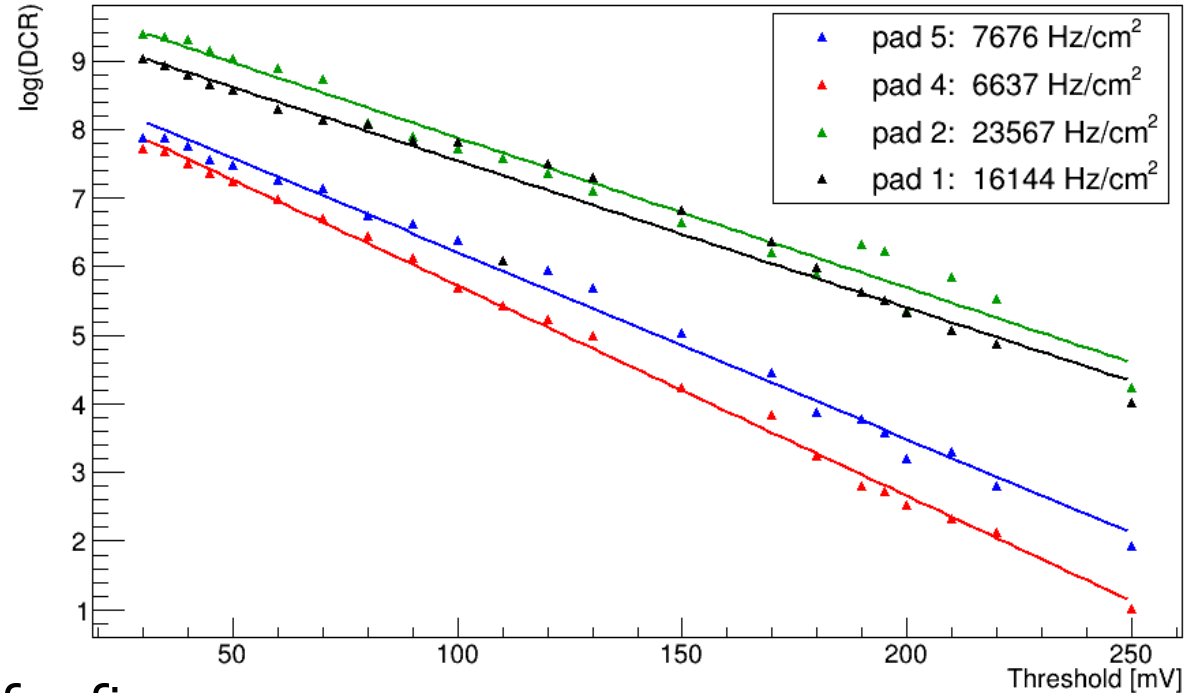
+ X →

DCR calculation

data_200_925_50V_0.5T_-40deg_fine-scan



data_200_925_50V_0.5T_-40deg_fine-scan



Data points for fine-scan

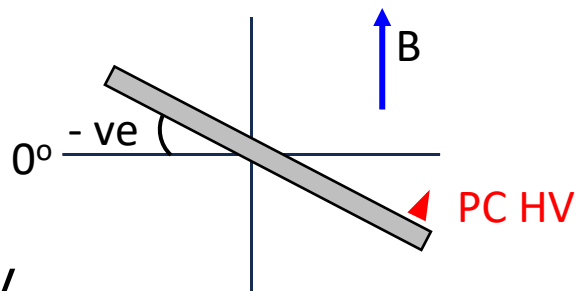
- Counts of counter module / (10 s X 0.36 cm²)
- Exponential Or linear function for fitting
- Intercept from fitting parameter
- $DCR = \exp(\text{intercept})$

1	2	3
4	5	6
7	8	9

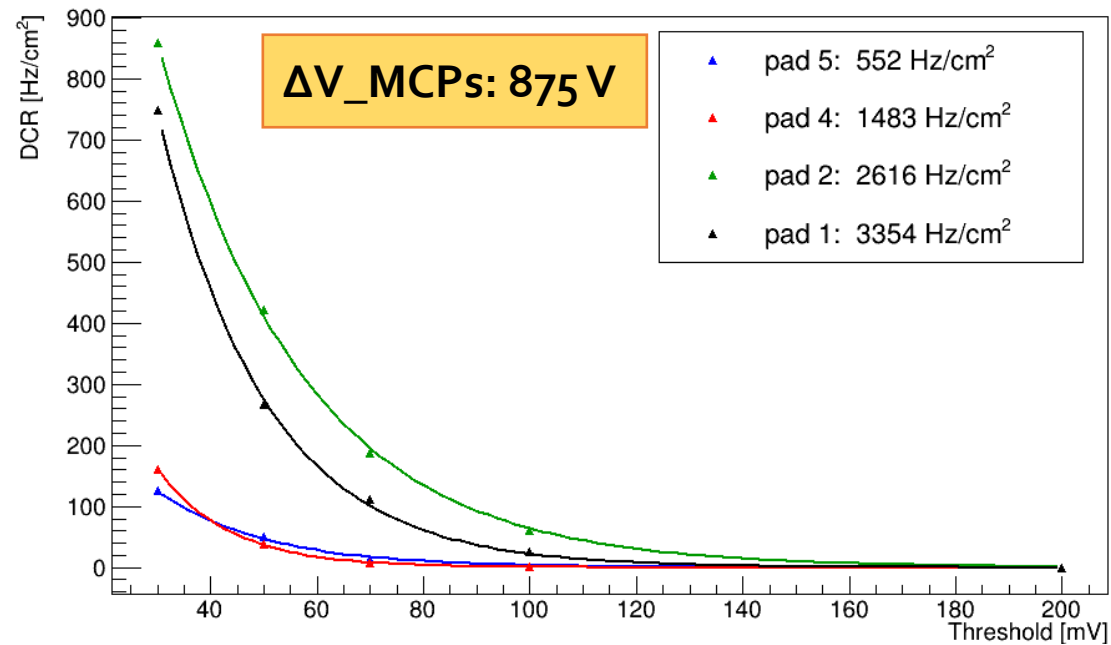
Pads 1, 2 noisy

DCRs ~ f(ΔV of MCPs)

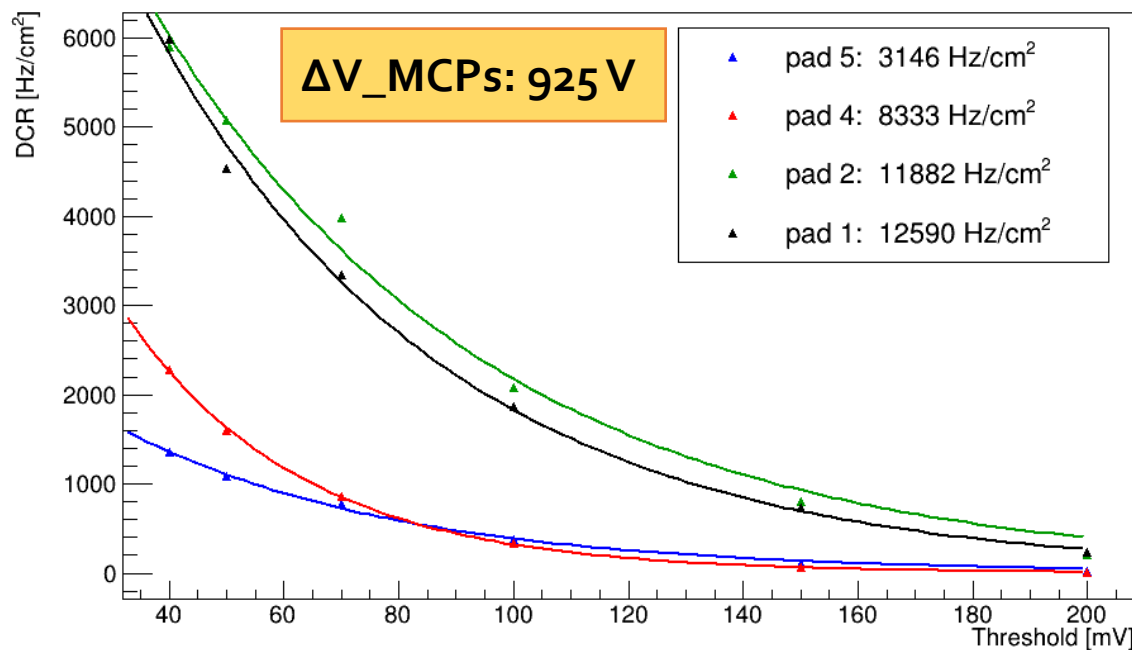
- Field: 0.5 T
- Tilt: -40°
- ΔV of gaps: 200 V
- ΔV between PC and Entry MCP: 50 V



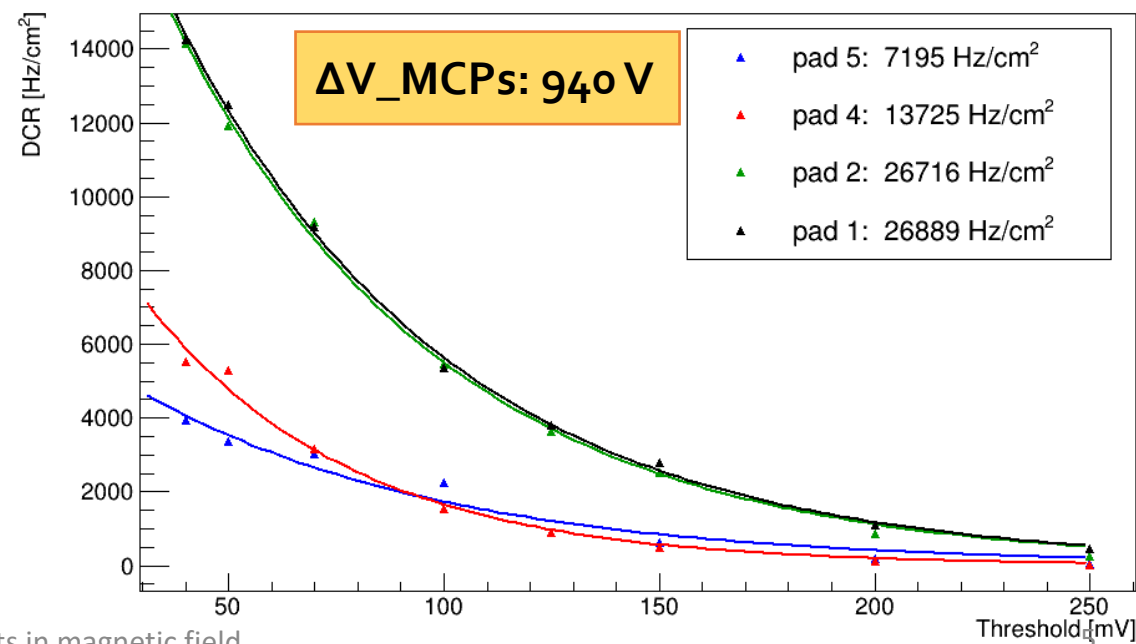
data_200_875_50V_0.5T_-40deg



data_200_925_50V_0.5T_-40deg

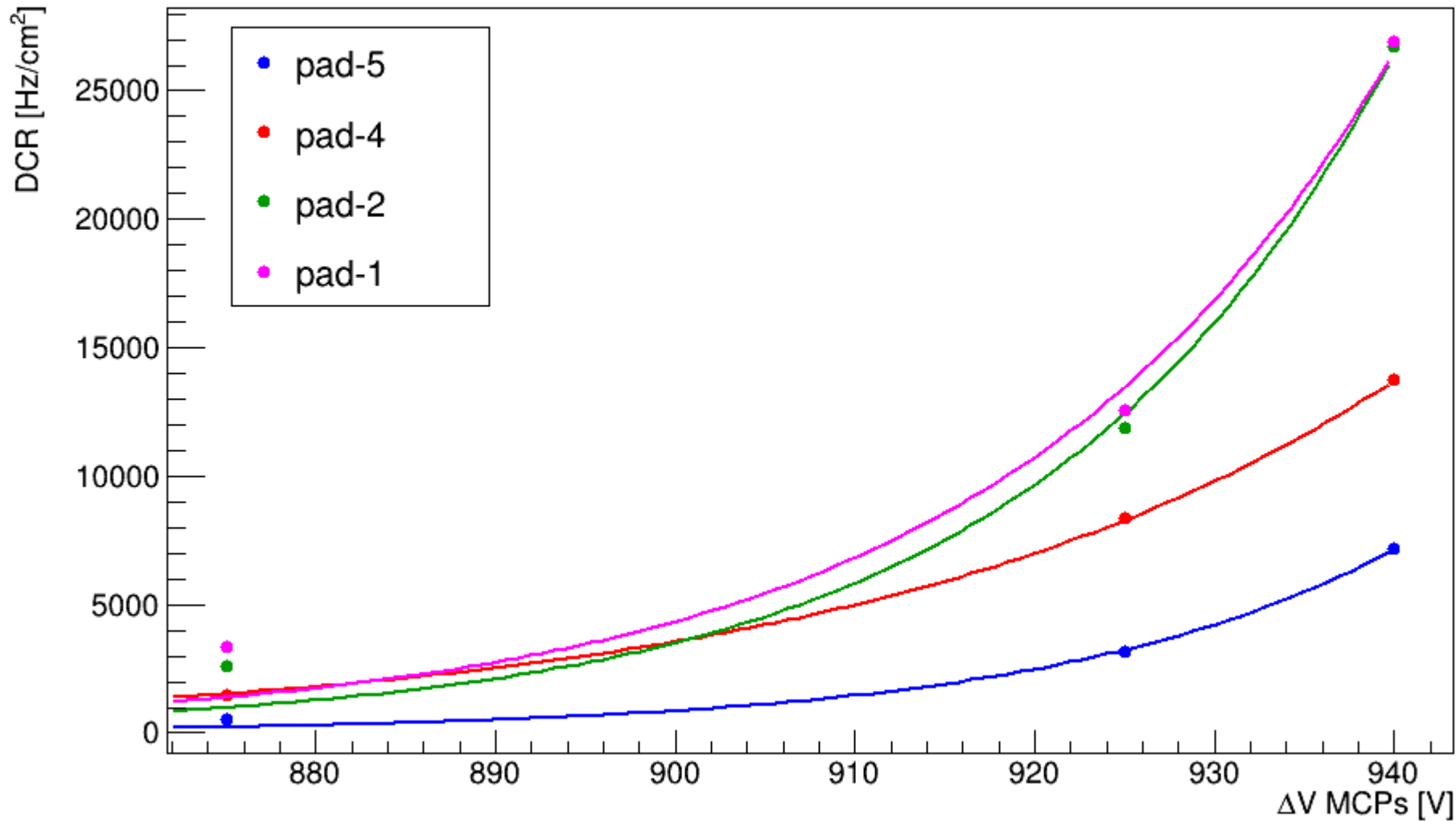


data_200_940_50V_0.5T_-40deg



DCRs ~ f(ΔV of MCPs)

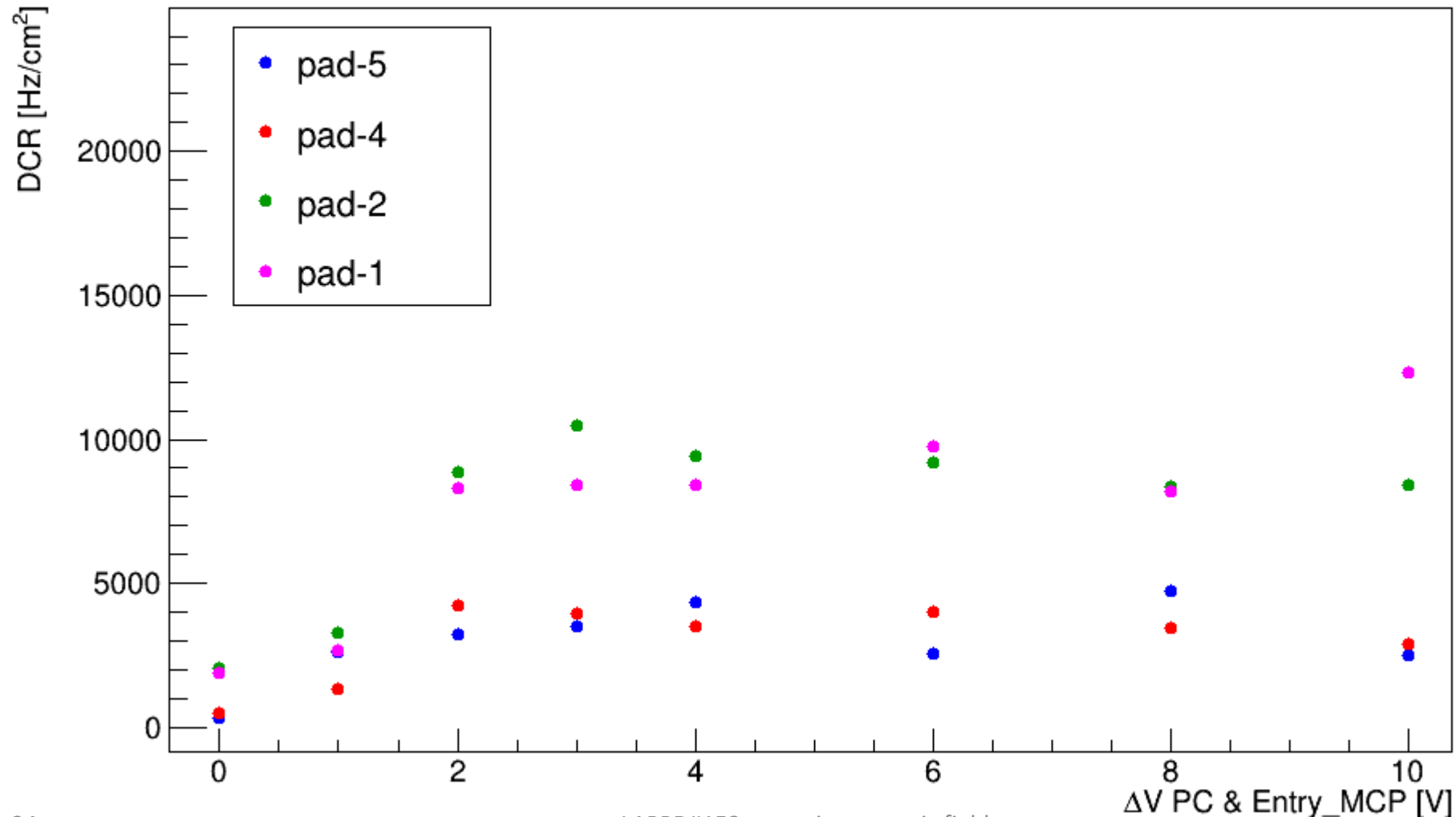
DCRs ~ f(ΔV MCPs) 200_MCPs_50V_0.5T_-40deg



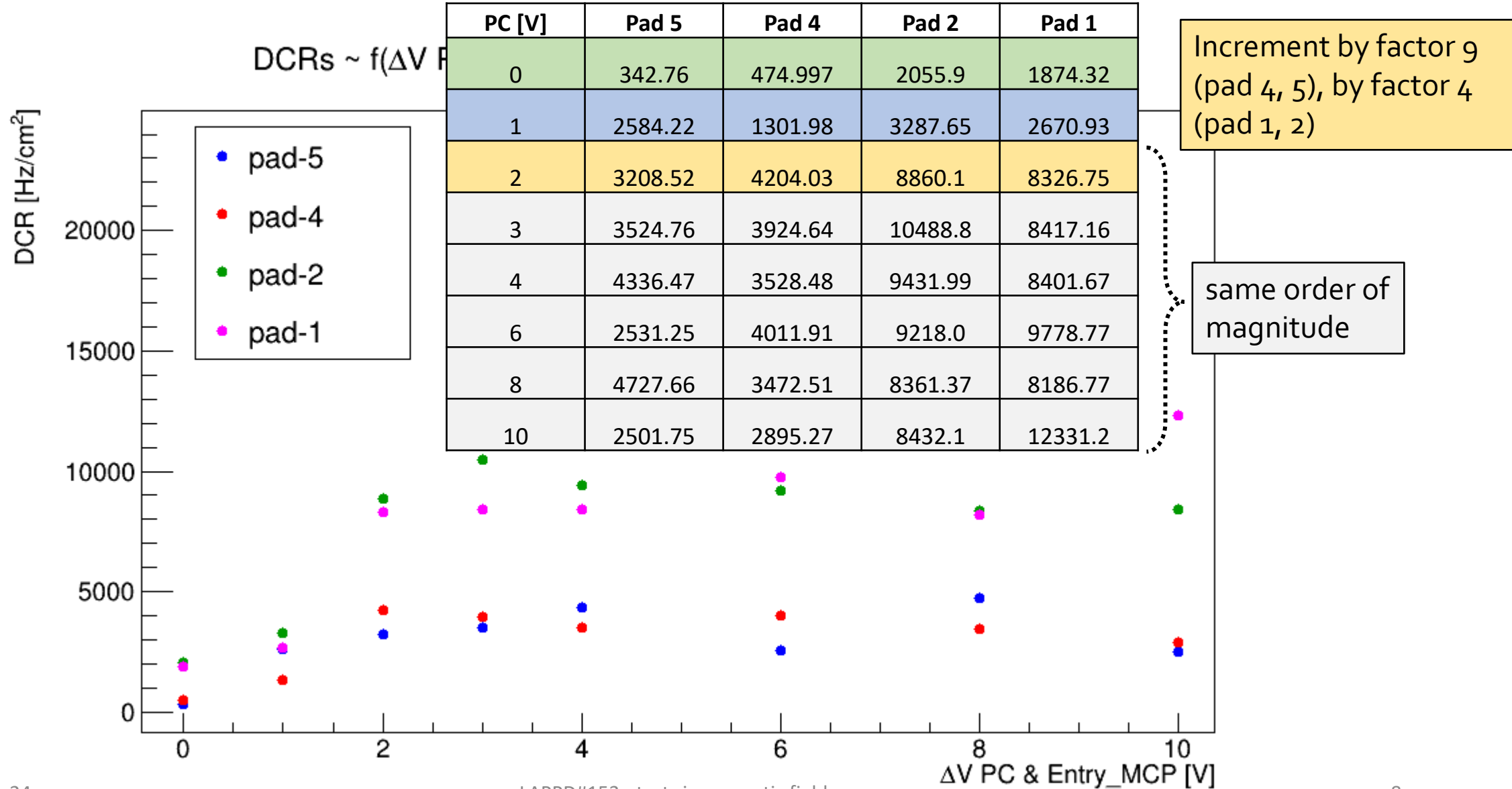
- Increment in ΔV MCPs by 65 V (940 - 875) V
- Factor ~10 increment in DCRs

DCRs ~ f(ΔV between PC and entry MCP)

DCRs ~ f(ΔV PC & Entry_MCP) 200_925V_PC_0.5T_-40deg

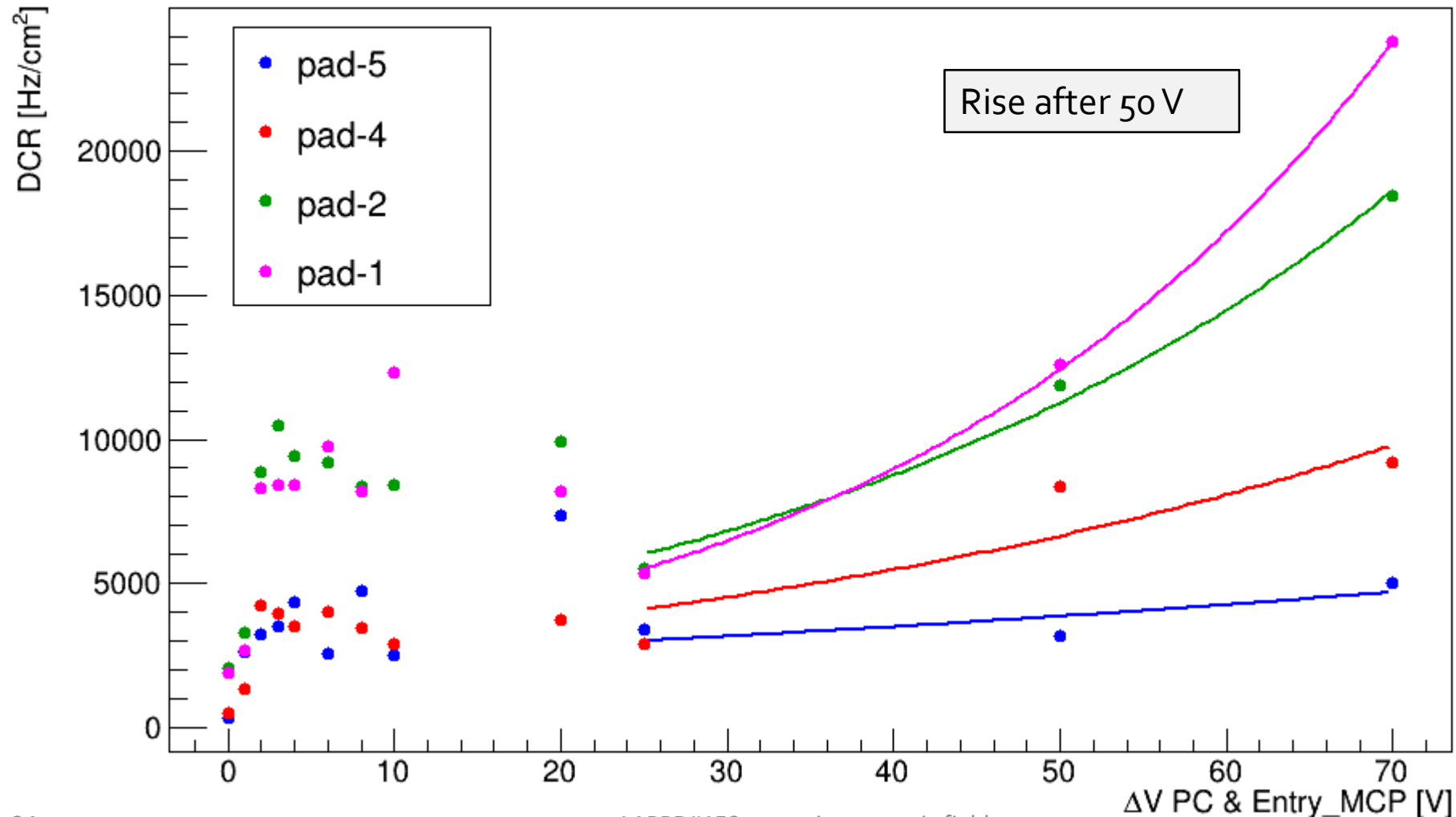


DCRs ~ f(ΔV between PC and entry MCP)



DCRs ~ f(ΔV between PC and entry MCP)

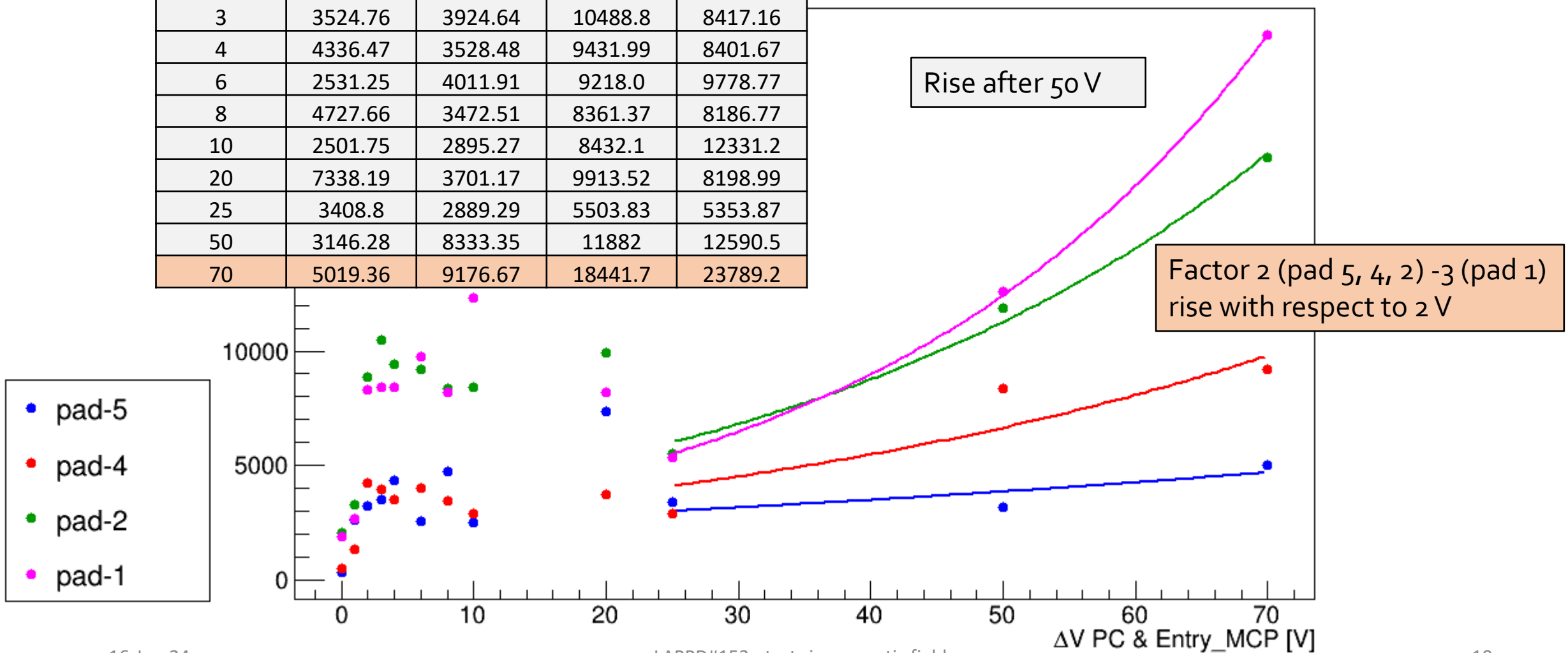
DCRs ~ f(ΔV PC & Entry_MCP) 200_925V_PC_0.5T_-40deg



DCRs ~ f(ΔV between PC and entry MCP)

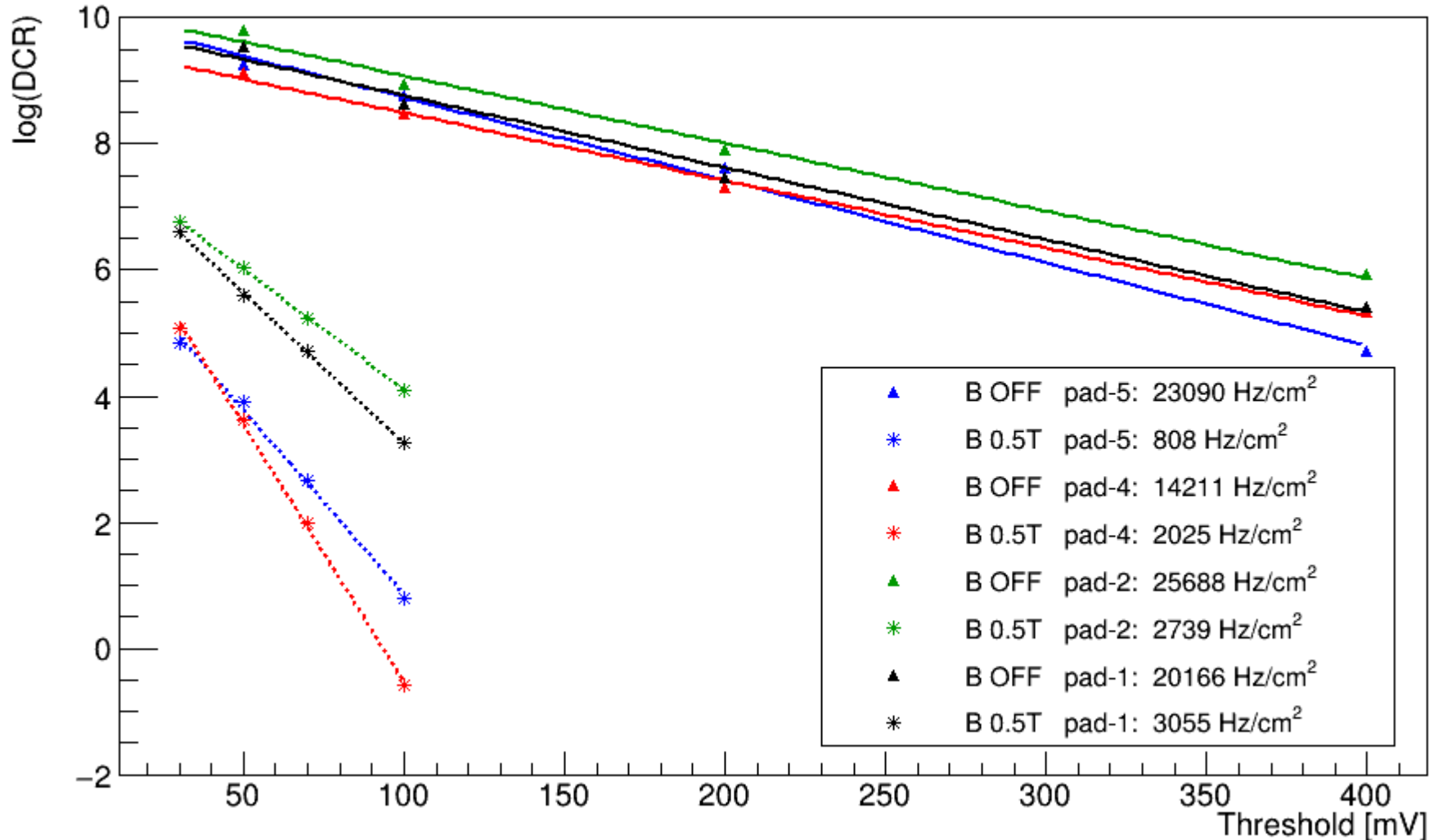
Pad_id	5	4	2	1
0	342.76	474.997	2055.9	1874.32
1	2584.22	1301.98	3287.65	2670.93
2	3208.52	4204.03	8860.1	8326.75
3	3524.76	3924.64	10488.8	8417.16
4	4336.47	3528.48	9431.99	8401.67
6	2531.25	4011.91	9218.0	9778.77
8	4727.66	3472.51	8361.37	8186.77
10	2501.75	2895.27	8432.1	12331.2
20	7338.19	3701.17	9913.52	8198.99
25	3408.8	2889.29	5503.83	5353.87
50	3146.28	8333.35	11882	12590.5
70	5019.36	9176.67	18441.7	23789.2

200_925V_PC_0.5T_-40deg



DCRs field ON vs. OFF

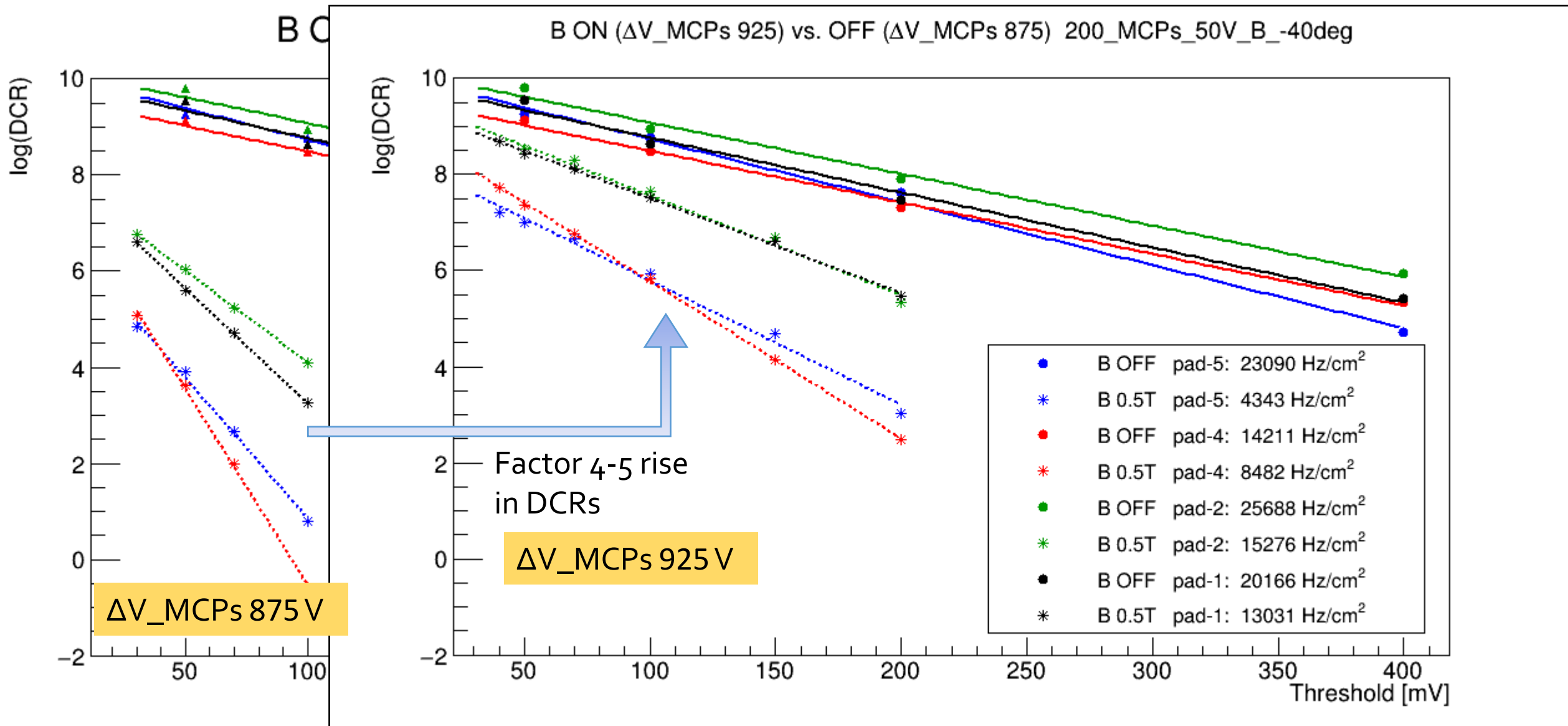
B ON vs. OFF 200_875_50V_B_-40deg



ΔV s: 200_875_50V
Orientation: -40°

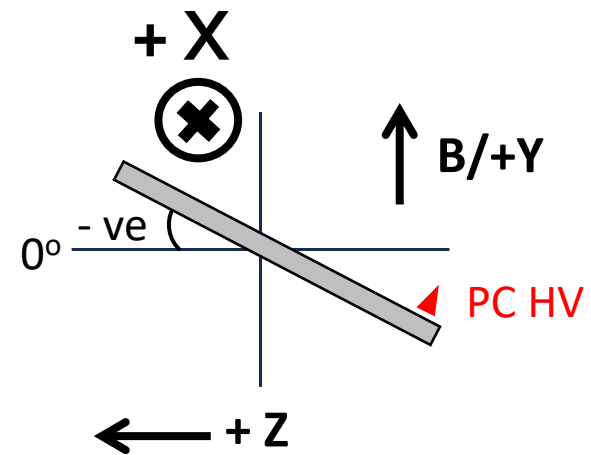
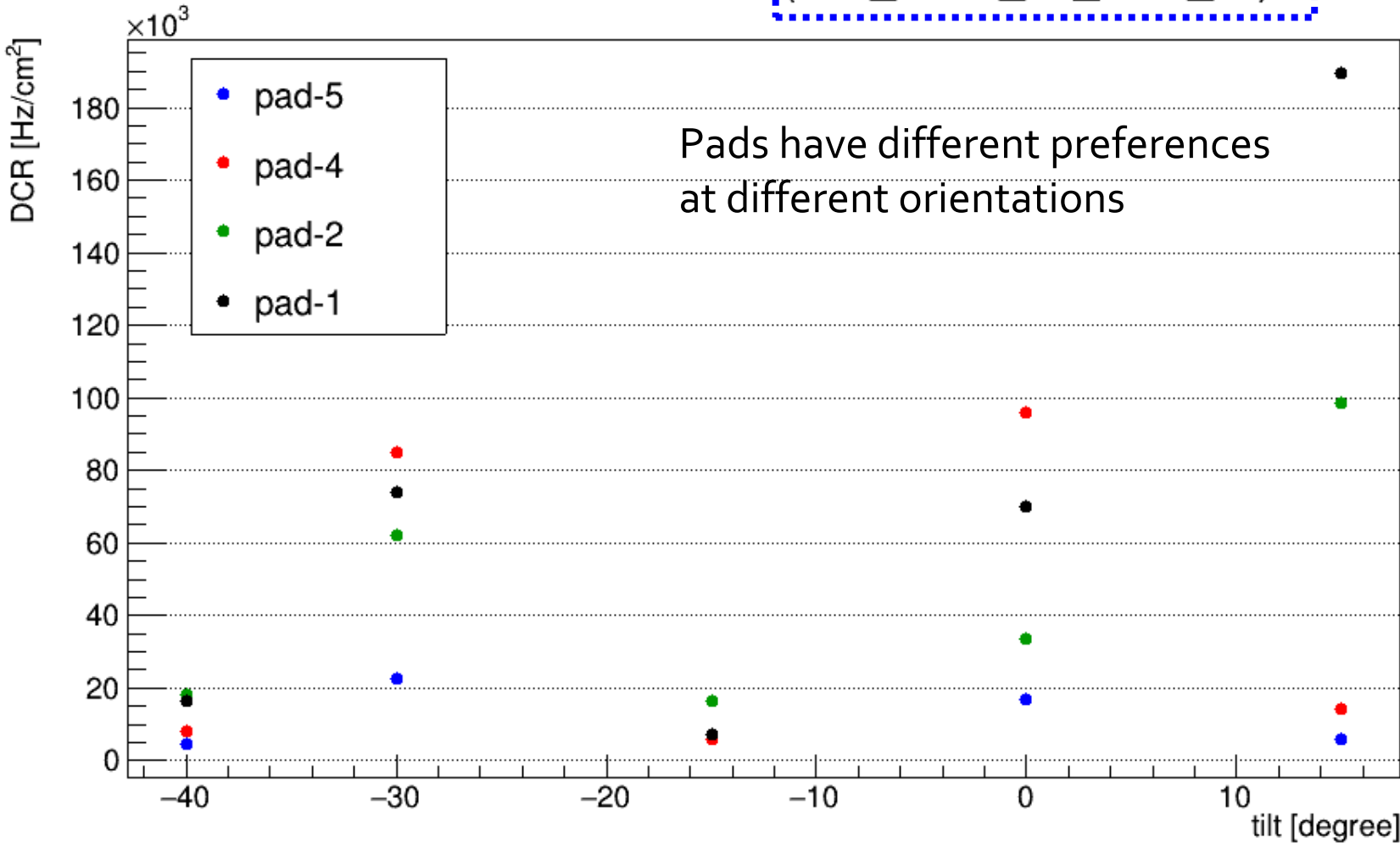
When B turned ON at 0.5T
factor ~10 (pad-1,2,6)-30
(pad-5) drop in DCRs

DCRs field ON vs. OFF

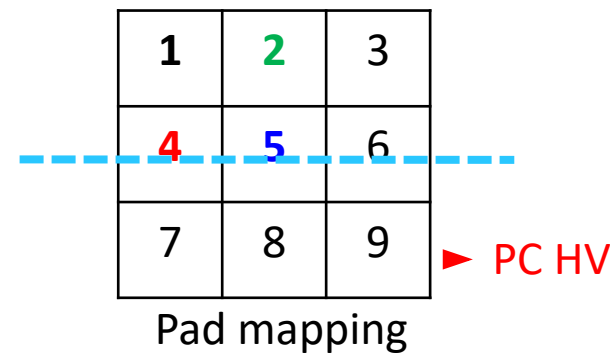


Scan of tilts

DCRs as a function of tilts (200_925V_70_0.5T_tilt)

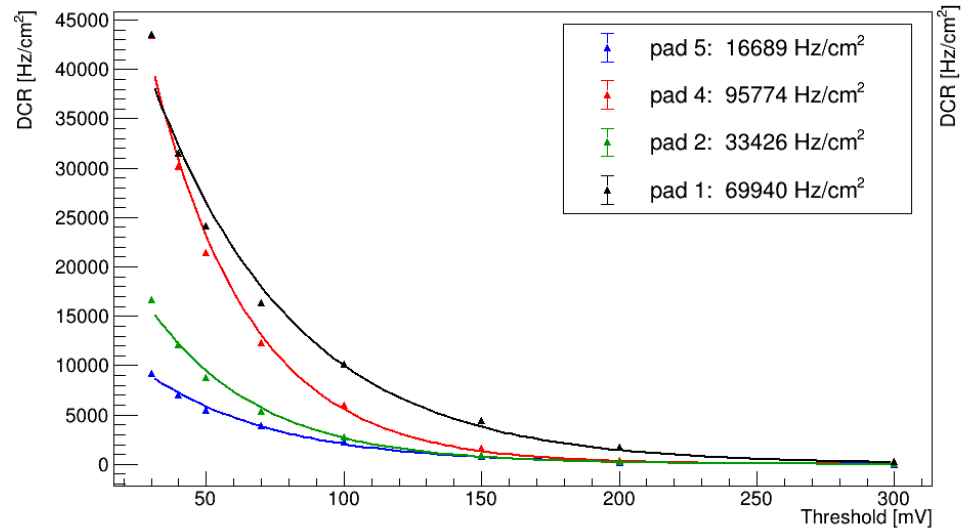


Axis of rotation (X-axis)

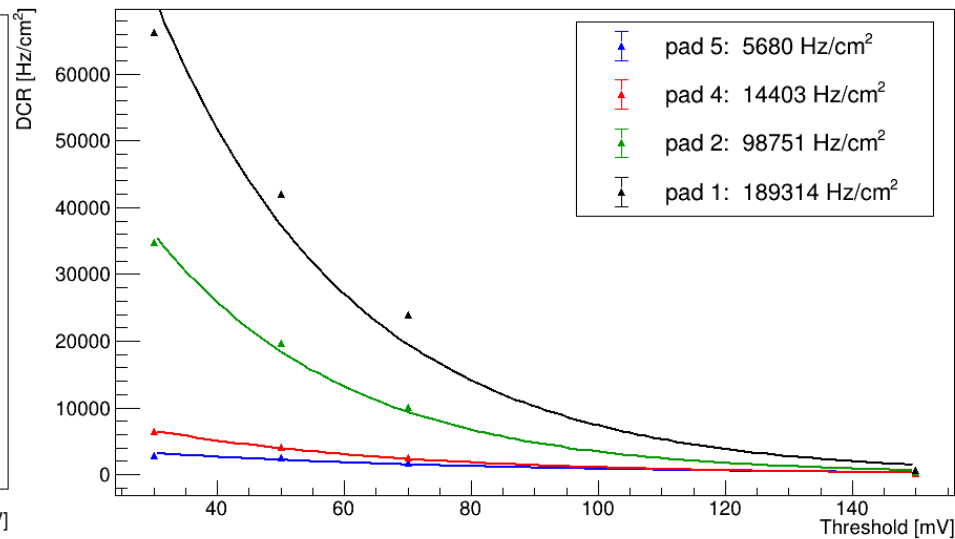


- ✓ +15°
- ✓ Ch 1, 2 down in vertical scale
- ✓ More preferences for hits

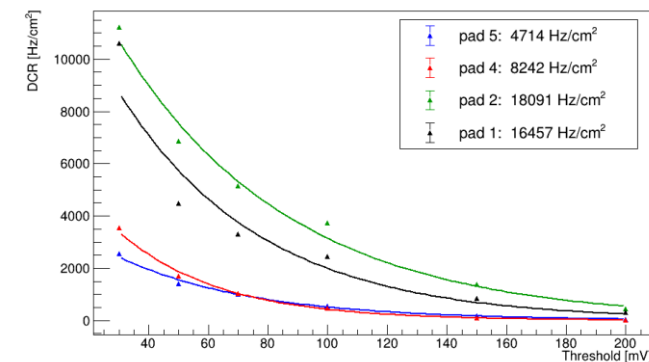
data_200_925_70V_0.5T_0deg



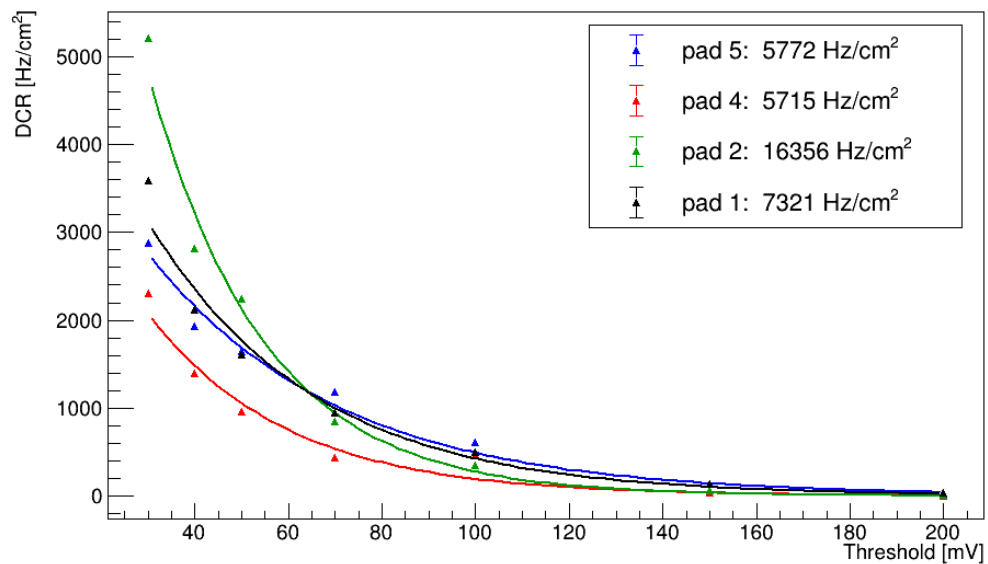
data_200_925_70V_0.5T_+15deg



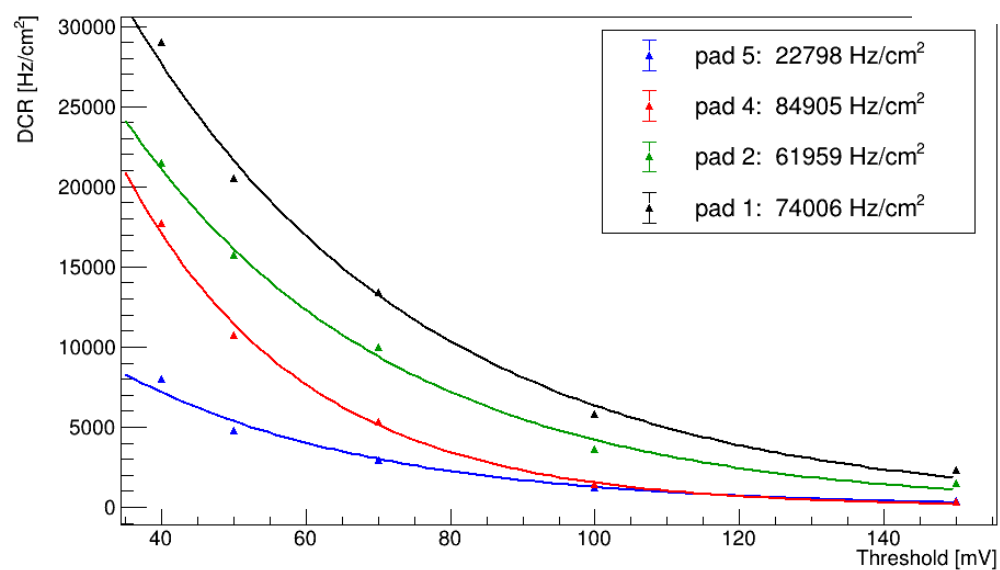
data_200_925_70V_0.5T_-40deg



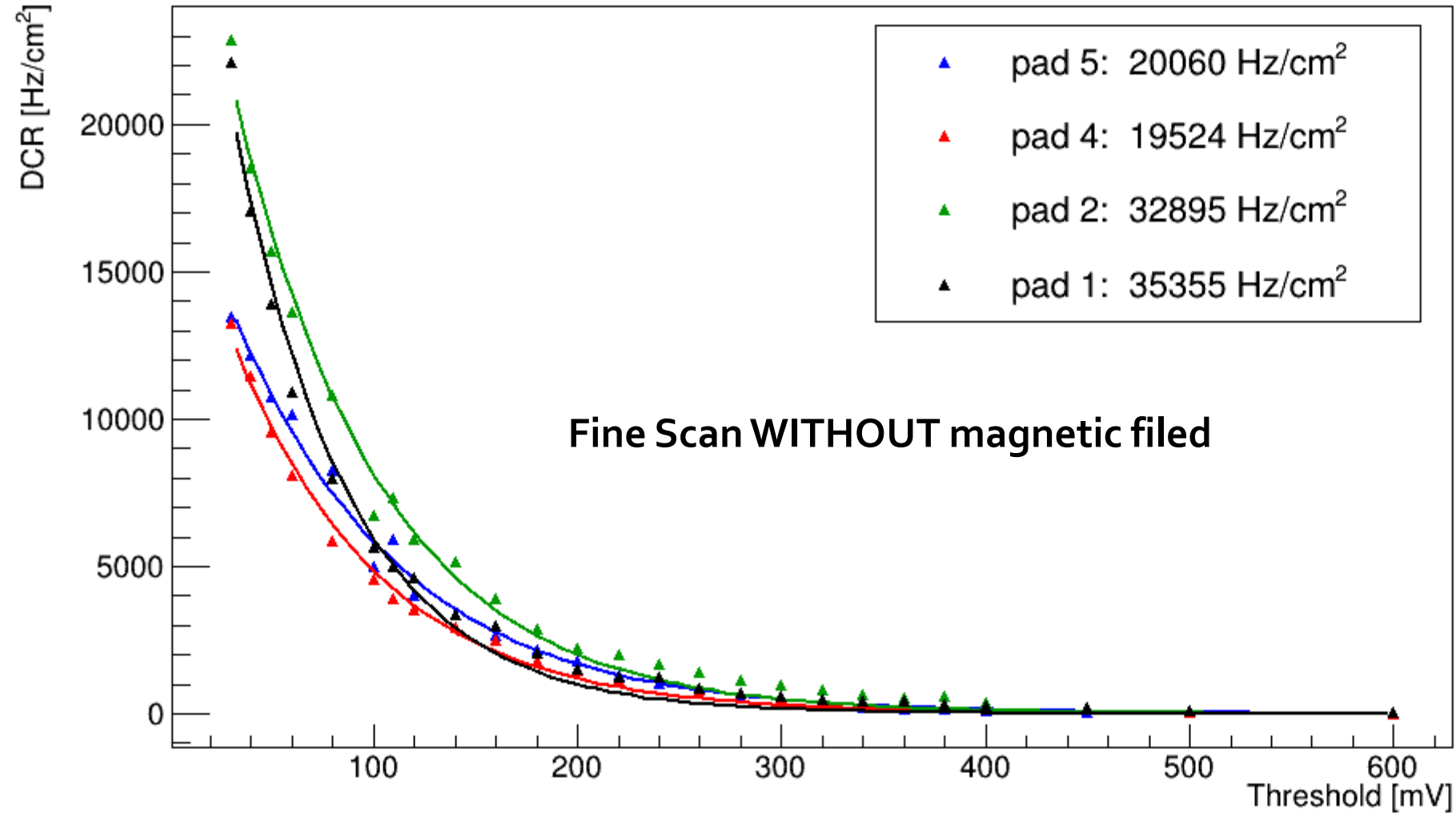
data_200_925_70V_0.5T_-15deg



data_200_925_70V_0.5T_-30deg



data_200_875_50V_0.0T_-40deg_fine-scan



data_200_925_50V_0.5T_-40deg_fine-scan

