“Old” FBK data for publication

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5/12/2023

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DUNE

FBK paper

Board: Me, Francesco Di Capua (Na), Andrea Ficorella (FBK), Antonio Verdugo (Ciemat)
Report from last meeting (friday):

- F. Di Capua (not present): working on the part regarding the measurements of the PDE at cold;
- A. Ficorella: resuming data from FBK (single trench + triple trench) 25 & 250 batches [PDE VS OV, Gain, history of the production, ….]
- Me: first analysis of old data, see next slides

FBK data

Following the suggestions of the past w.g. meeting I tried to re-organize old data.
Considerations:
Data from Maura Spanu (2021): 25 and 250 batch campaign are mixed and it is not clear to me how many data have been used for the calculations.
For the IV: the range for Rq is not defined among labs: inconsistency of some results.
The OV for PDE (+3.5=40%, +4.5=45%, +7=50%) has been redefined during measurements and this caused (mess) inconsistency of some results.
Using some data from Maura + integration I found in past presentations + REMOVAL of entire sets of data, I obtained some acceptable results.
Caveat: everyone has to be aware that data have been "cleaned" otherwise results are not consistent. Let's discuss if we would like to continue in this direction or not.

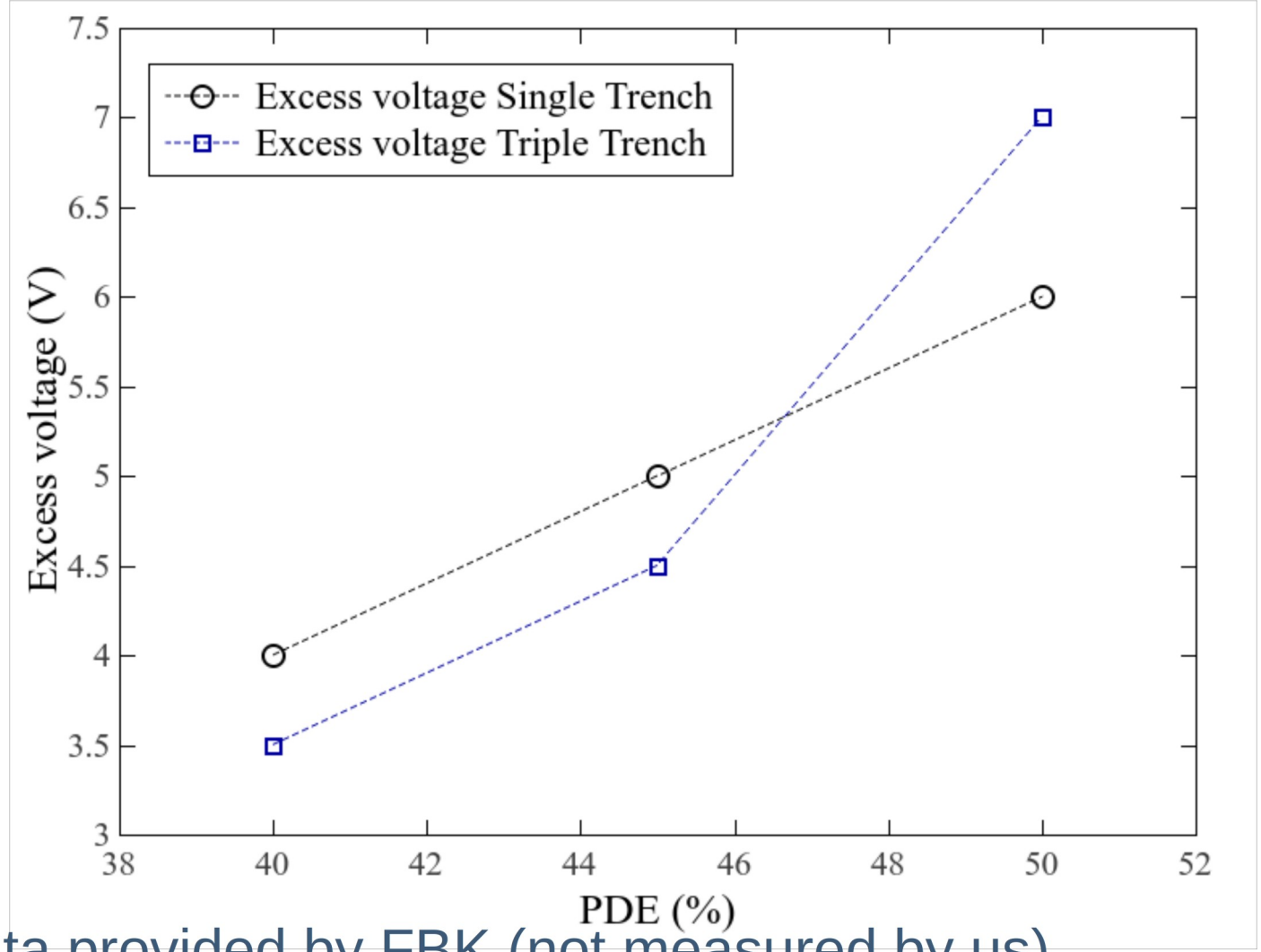
FBK data

single trench
Vbd@300K=33.1pm0.1
Rq@300K=19pm2 [no Ferrara]
Vbd@LN2(1)=27pm0.01 [no Bologna]
Rq@LN2(1)=74pm3 [no Ferrara]
Vbd@LN2(20)=27.1pm0.02 [no Bologna]
Rq@LN2(20)=72pm3 [no Ferrara]
Gain+4=1.9pm0.1e6 [only Mib and Valencia]
Gain+5=2.4pm0.4e6 [only Mib and Valencia]
Gain+6=3.2pm0.5e6 [only Mib and Valencia]
DCR+4=66pm12 [no Madrid, no Bologna]
DCR+5=70pm13 [no Madrid, no Bologna]
DCR+6=81pm13 [no Madrid, no Bologna]
AP+4=1.9pm1
AP+5=1.7pm0.8
AP+6=2.4pm1
XT+4=18pm7
XT+5=21pm3
XT+6=28pm3

FBK data

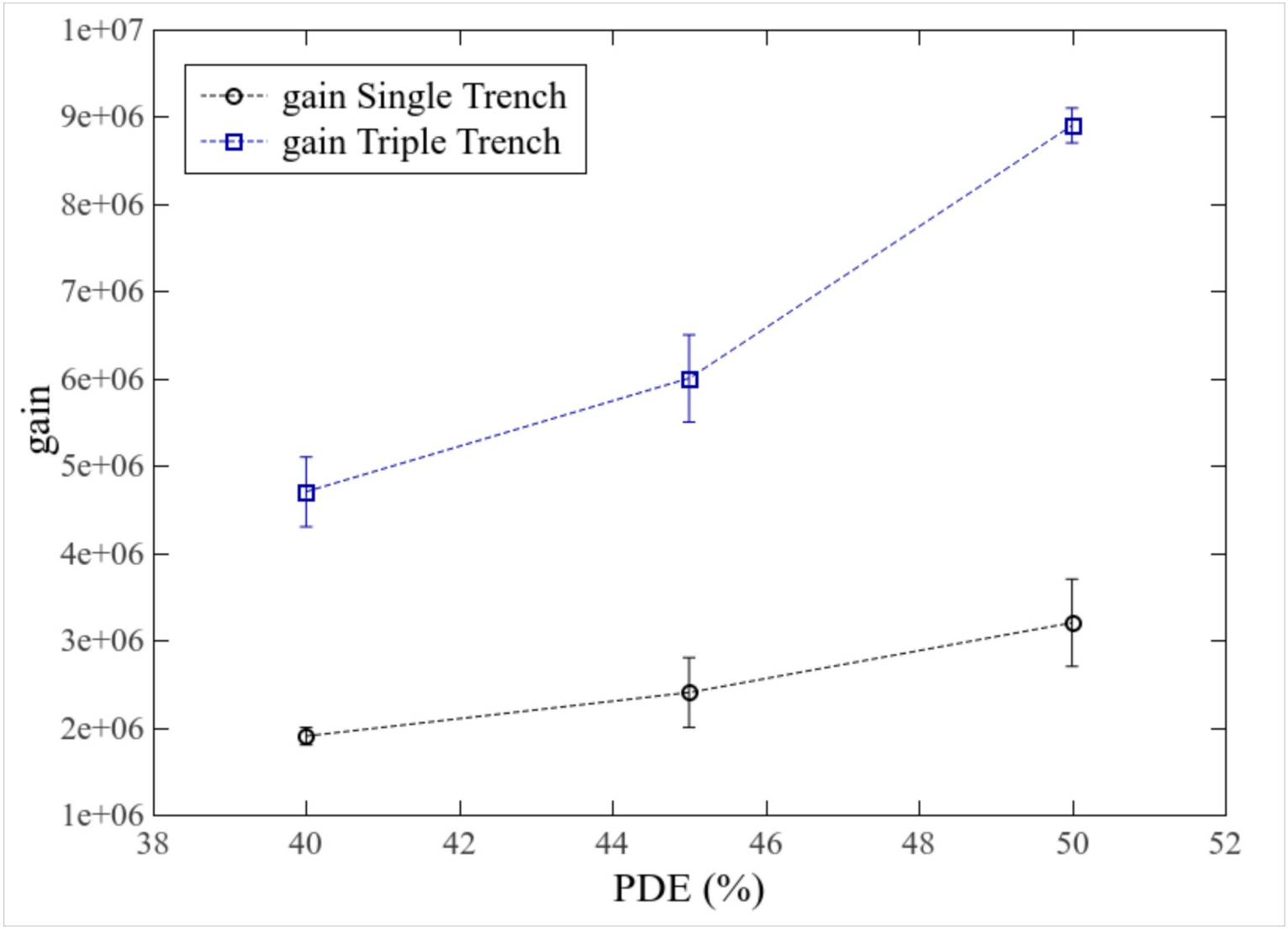
triple trench
Vbd@300K=33pm0.1 [no Bologna]
Rq@300K=50pm1 [no Ferrara]
Vbd@LN2(1)=27.07pm0.04 [no Bologna]
Rq@LN2(1)=237pm8 [no Ferrara]
Vbd@LN2(20)=27.08pm0.02 [no Bologna]
Rq@LN2(20)=236pm7 [no Ferrara]
Gain+3.5=4.7pm0.4e6 [only Mib and Valencia]
Gain+4.5=6pm0.5e6 [only Mib and Valencia]
Gain+7=8.9pm0.2e6 [only Mib and Valencia]
DCR+3.5=53pm17 [no Madrid, no Bologna, no Praga]
DCR+4.5=59pm20 [no Madrid, no Bologna]
DCR+7=73pm16 [no Madrid, no Bologna, no Praga]
AP+3.5=1.6pm0.7 [no Madrid, no Prague]
AP+4.5=2pm0.7 [no Madrid]
AP+7=3.3pm0.6 [no Madrid, no Prague]
XT+3.5=12pm4 [no Madrid, no Prague]
XT+4.5=16pm3 [no Madrid]
XT+7=32pm5 [no Madrid, no Prague]

FBK data

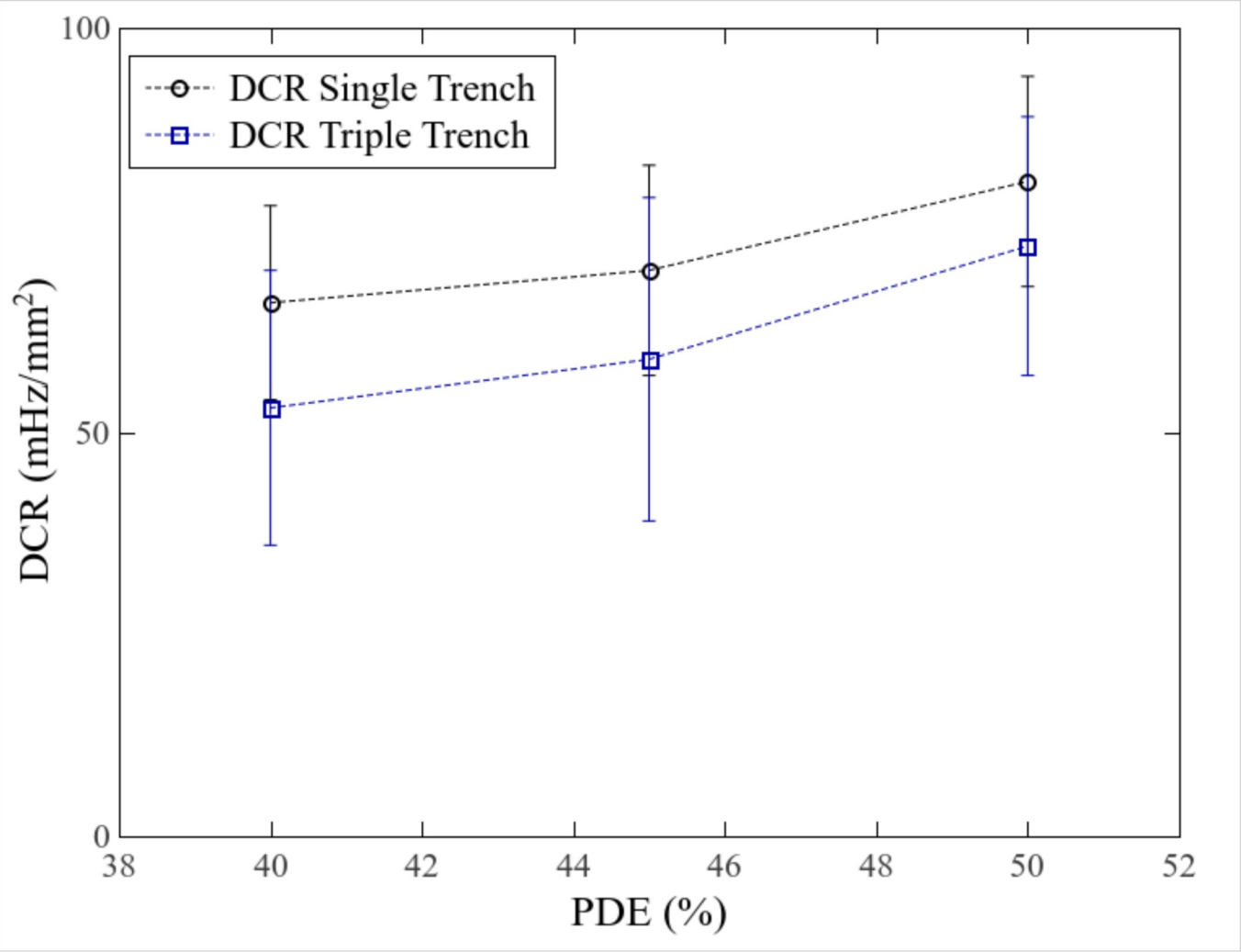


NB:Data provided by FBK (not measured by us)

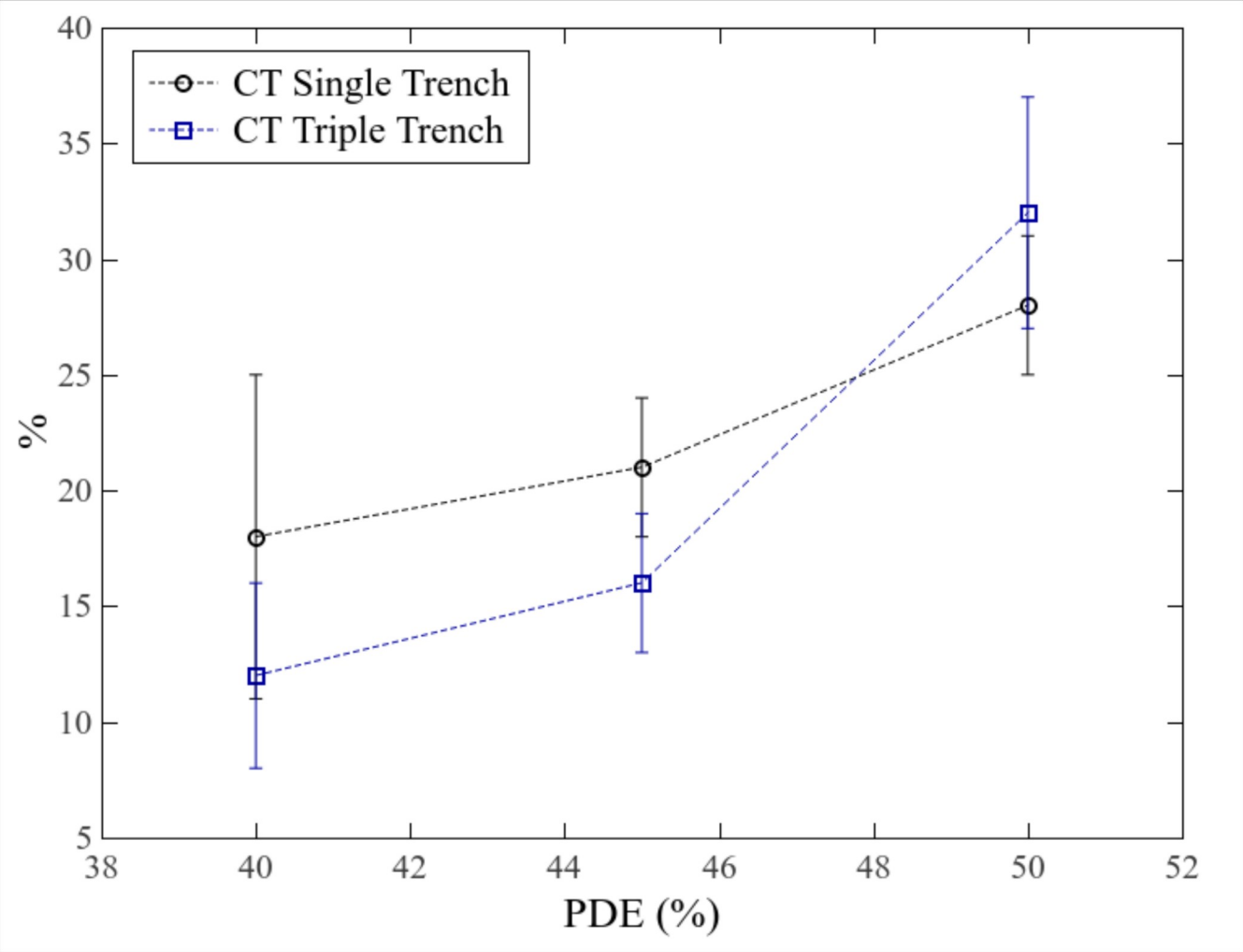
FBK data


gain Single Trench
gain Triple Trench
gain
PDE (%)
1e+07
9e+06
8e+06
7e+06
6e+06
5e+06
4e+06
3e+06
2e+06
1e+06
38
40
42
44
46
48
50
52

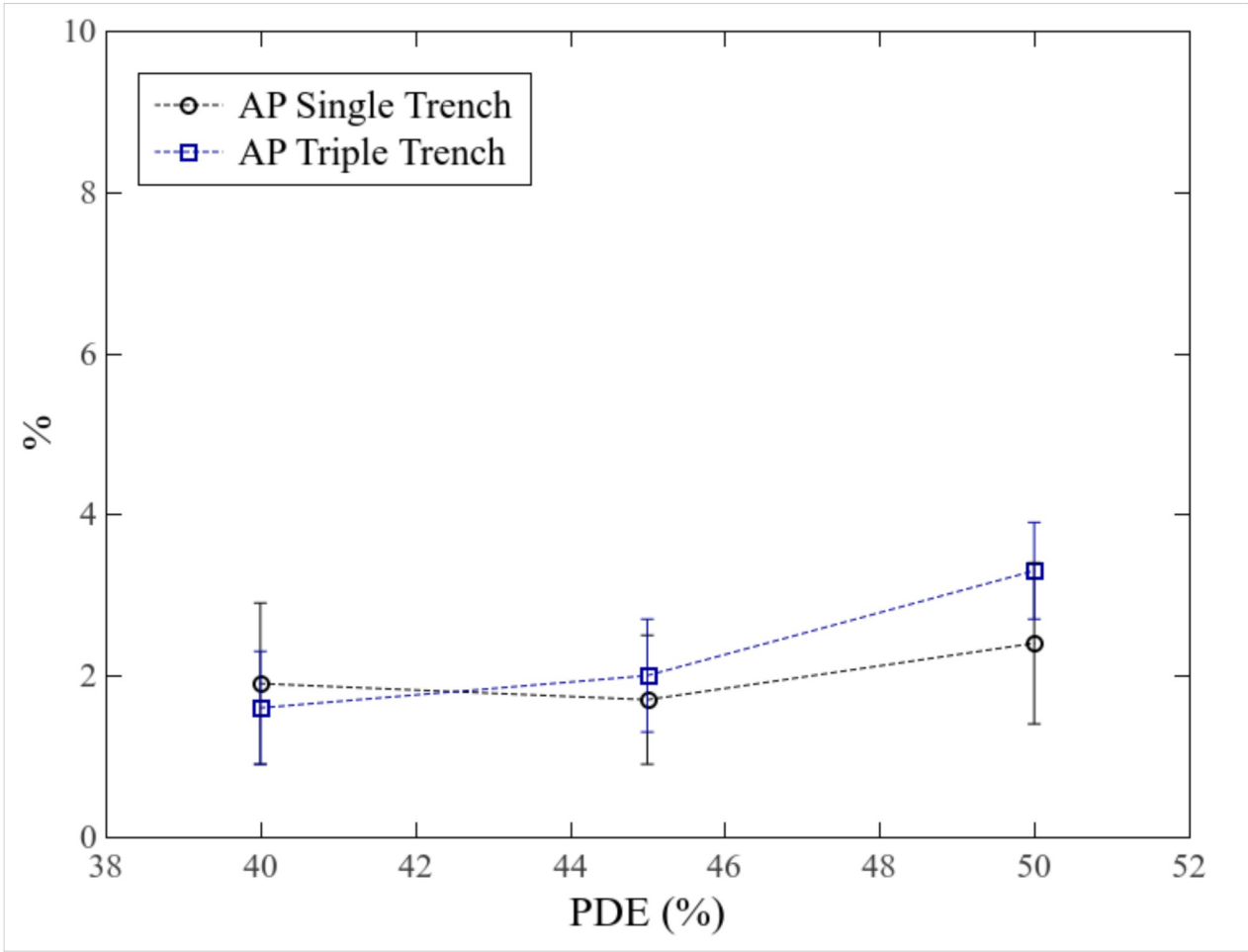
FBK data


DCR Single Trench
DCR Triple Trench
DCR (mHz/mm^2)
PDE (%)
100
50
0
38
40
42
44
46
48
50
52

FBK data


CT Single Trench
CT Triple Trench
%
PDE (%)
40
35
30
25
20
15
10
5
38
40
42
44
46
48
50
52

FBK data


AP Single Trench
AP Triple Trench
%
PDE (%)
0
2
4
6
8
10
38
40
42
44
46
48
50
52

FBK data

Today news:
I have been informed by A. Ficorella that the correct values of OV in order to obtain PDE (room T 435nm) at 40%, 45% and 50% are:
Single trench: 4, 5.2, 7.8
Triple trench: 3.4, 4.5, 7
This means that for 3T our measurements (the labs that used 3.5, 4.5, 7) are OK but for single trench our data (OV=4,5,6) refers to unknown values of PDE.

My proposal at this point is to NOT describe single trench in the paper but only triple trench sensors.

Conclusions

The work on the paper is going on but many difficulties...
Please let me know if you agree with this data or if you would like to change something. Let's discuss!

Also, if you have other suggestions let me know!

Thanks to all!!!!!!