Status of SiPM tests and setups

2023/07/11

Photosensor WG Meeting

M. Pozzato on behalf of Bologna Group

Received Strips


Performed Tests:

- IV @ T_{ROOM}
- IV @ T_{LN}
- Thermal Stresses
- DCR
- Extended IV (up to V_{BD} + 10V)

| Delivery	Box #	New Box #	Trays	Boards/Box	Trays reorder	Mechanical meas	TX Date	To	FedEx Tracking #
1	7		58-63, 73-75, 94-96, 103-114	400	73-96	OK	09/03/2023	Bologna-Alessandro	771504684879
1	5		10-30, 118-120	400	25-48	OK	08/05/2023	Bologna-Alessandro	772055783250
2	11		49-72	400		OK	22/06/2023	Bologna-Alessandro	772524663191

First Box – 2400 SiPMs

ROOM
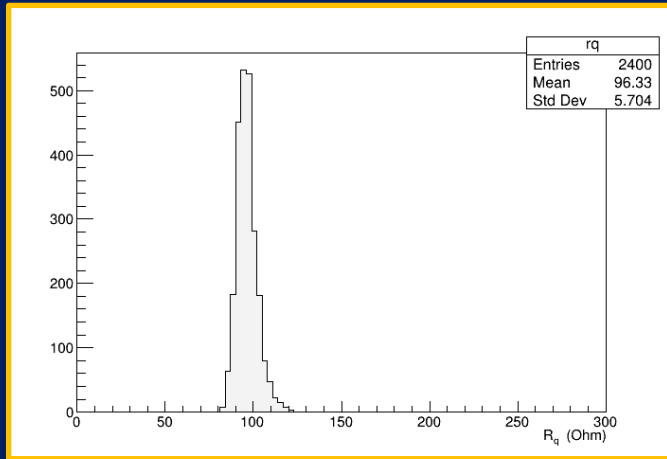
LN
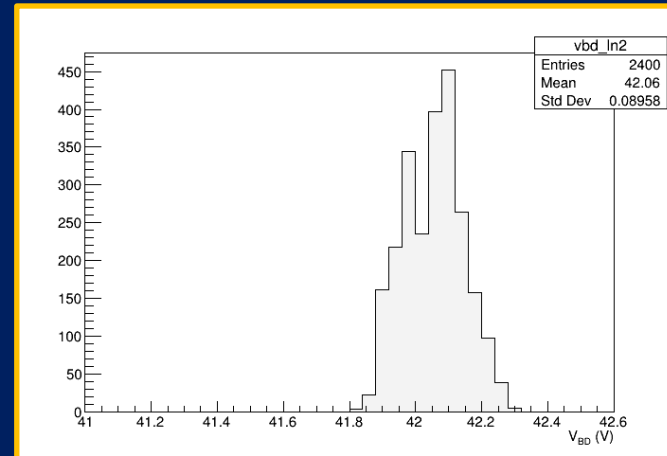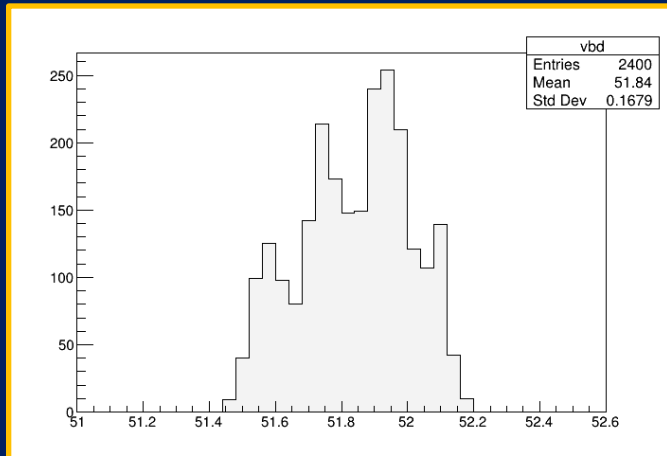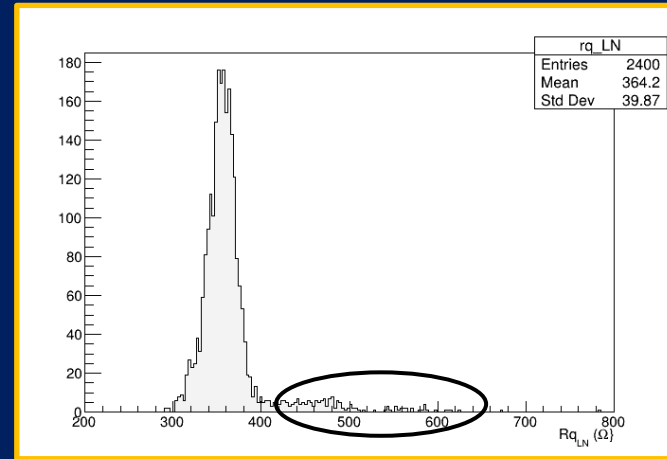
Problem in V_{bias} Electrical Connection
→ Fixed after changing the cable

Problems on V$_{BIAS}$ distribution

Curve IV: forward ARDU_0_SiPM_00

Curve IV: reverse ARDU_0_SiPM_00
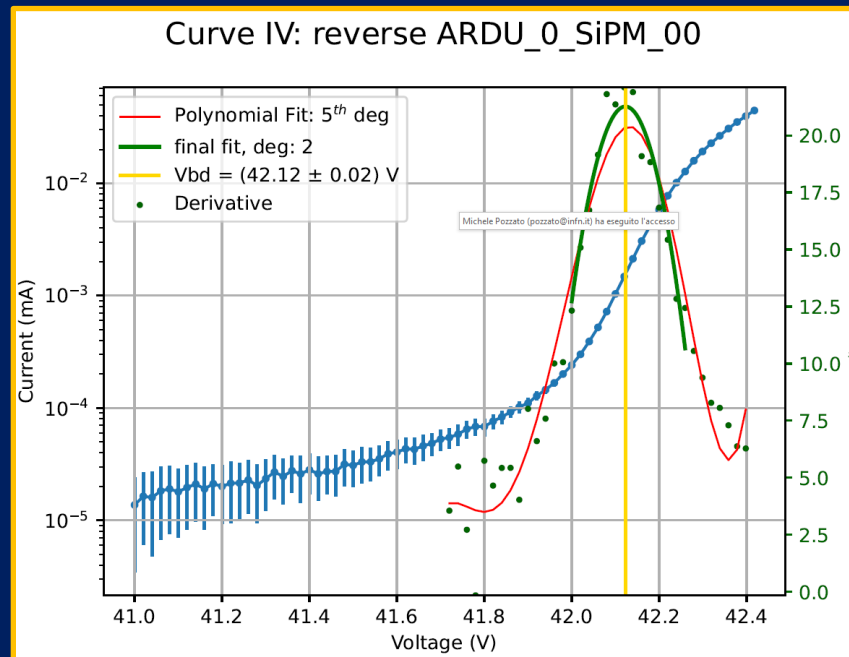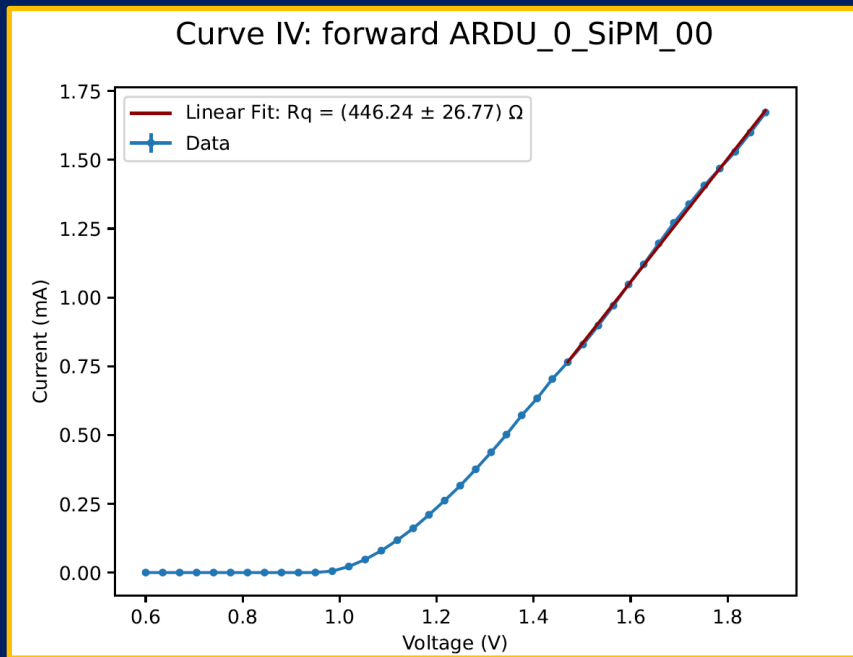
Not «visible» by looking at data: R$_q$ is higher than «normal» but no hint on problems

Reverse is normal

Curve IV: forward ARDU_0_SiPM_00

Curve IV: reverse ARDU_0_SiPM_00
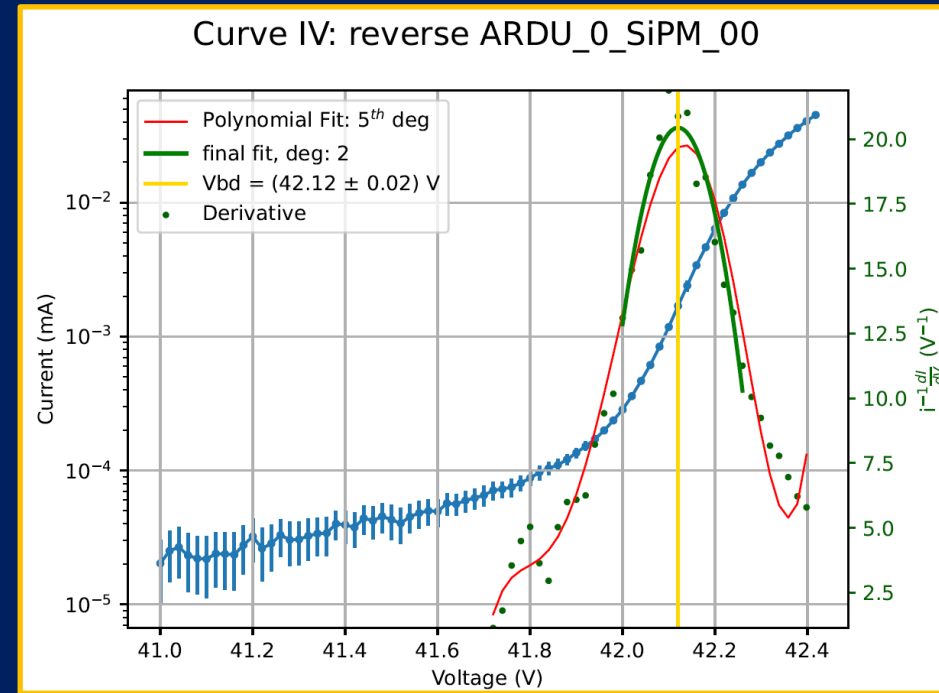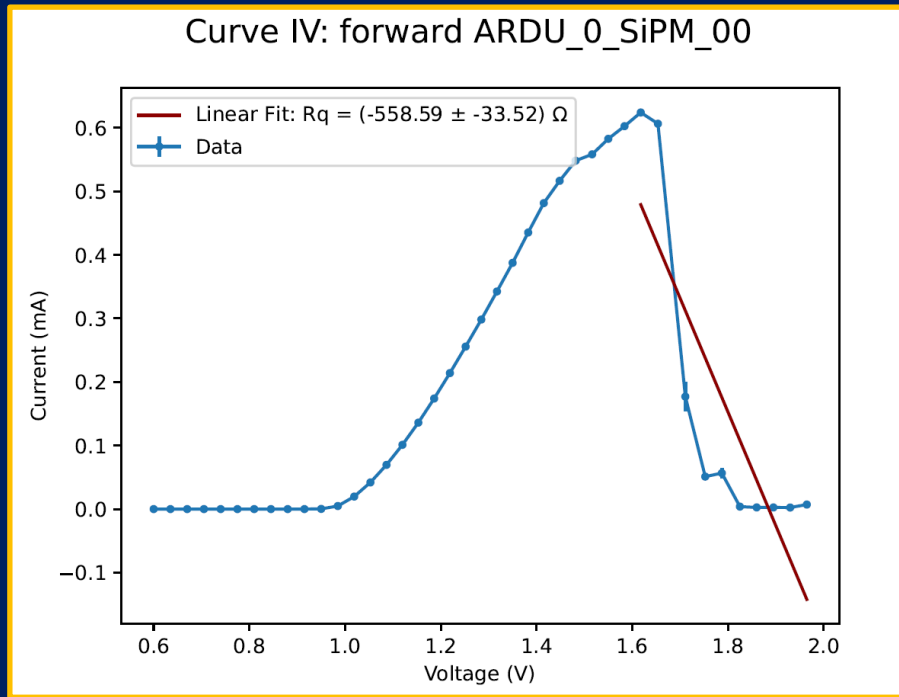
Visible by looking at data in forward polarization
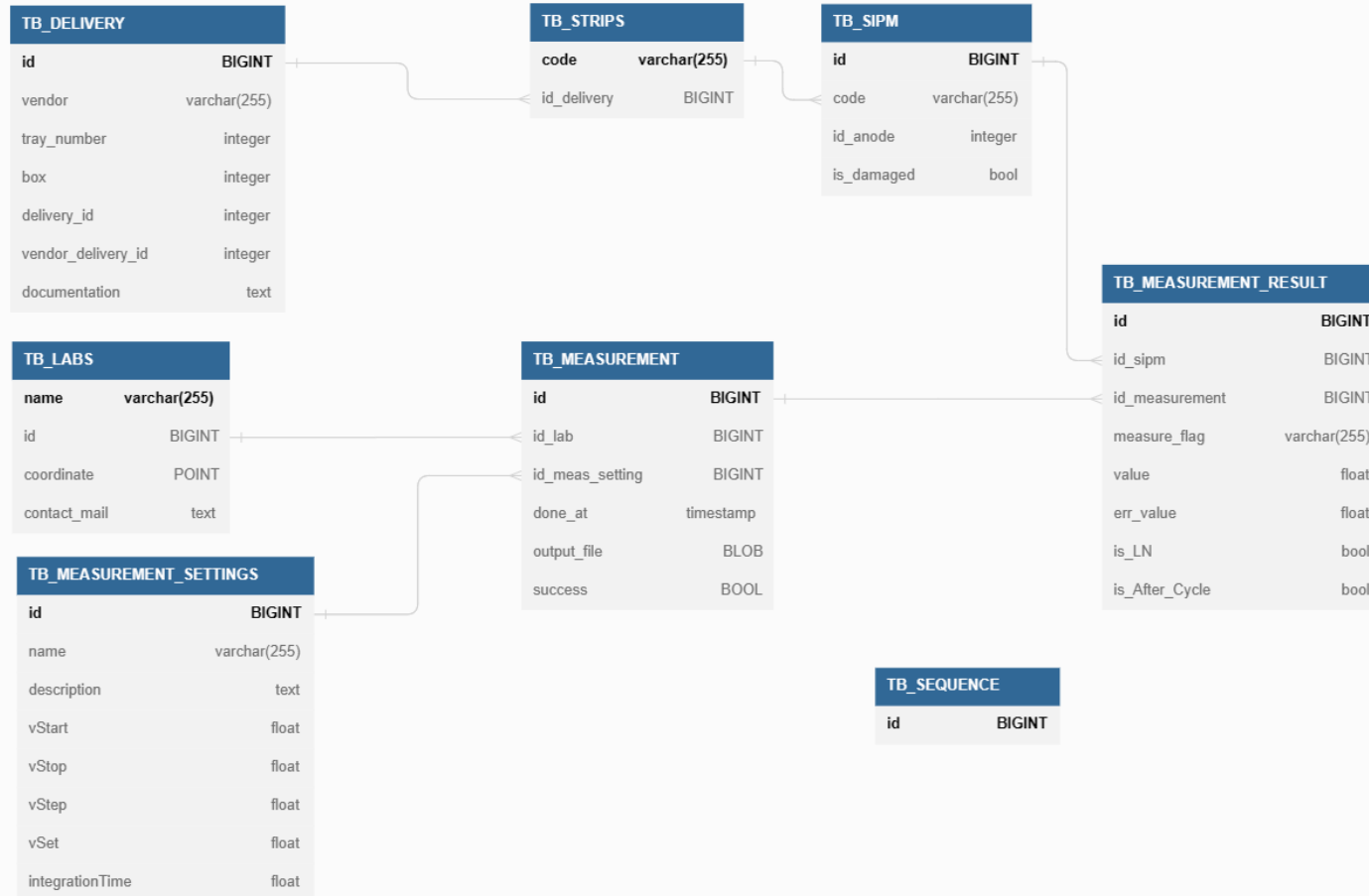Reverse polarization is normal

Fixed by changing cables

DCR - examples

- CACTUS setup is near to INFN mechanical workshop
- Some channels are noisy (here below one of them)

```
Wed May 24 14:41:19 2023
ARDU [0-3]       SiPM [0-29]      ARRAY ID        SiPM position [0-5]      Counts

2        3        Strip10 3        194
2        2        Strip10 2        106
2        1        Strip10 1        86
2        0        Strip10 0        115
2        24       Strip14 0        137731
2        25       Strip14 1        83
2        26       Strip14 2        109
```

- NOT due to SiPMs with high dark current:
  - Checked by applying 0 V to the SiPMs and by changing SiPMs positions

My SQL Database

Example on extracted data

Conclusions

- CACTUS @Bologna working well:
  - 120 SiPMs /day
  - First box completed;
  - Second box (50% completed)
    - To be completed by the end of this month
  - Third box received
  - We had some problems in the Vbias distribuition → solved
  - We experience some noise in the DCR measurements
    - Extended IV doesn't show problematic sipms
- Local DB created in order to:
  - Backup data;
  - Create .csv files to push into DUNE DB