Update on sensor tests

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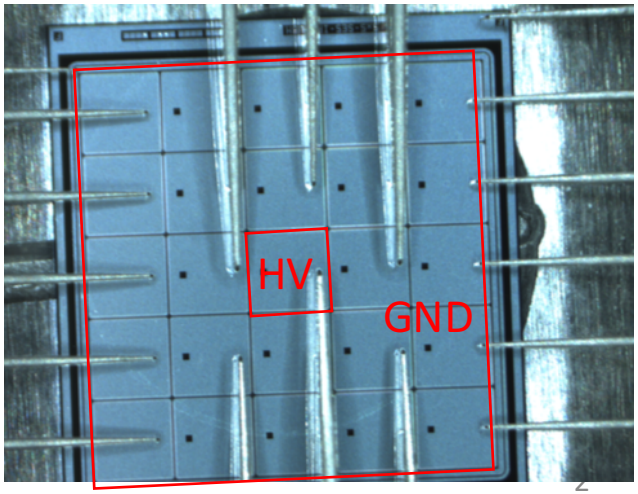
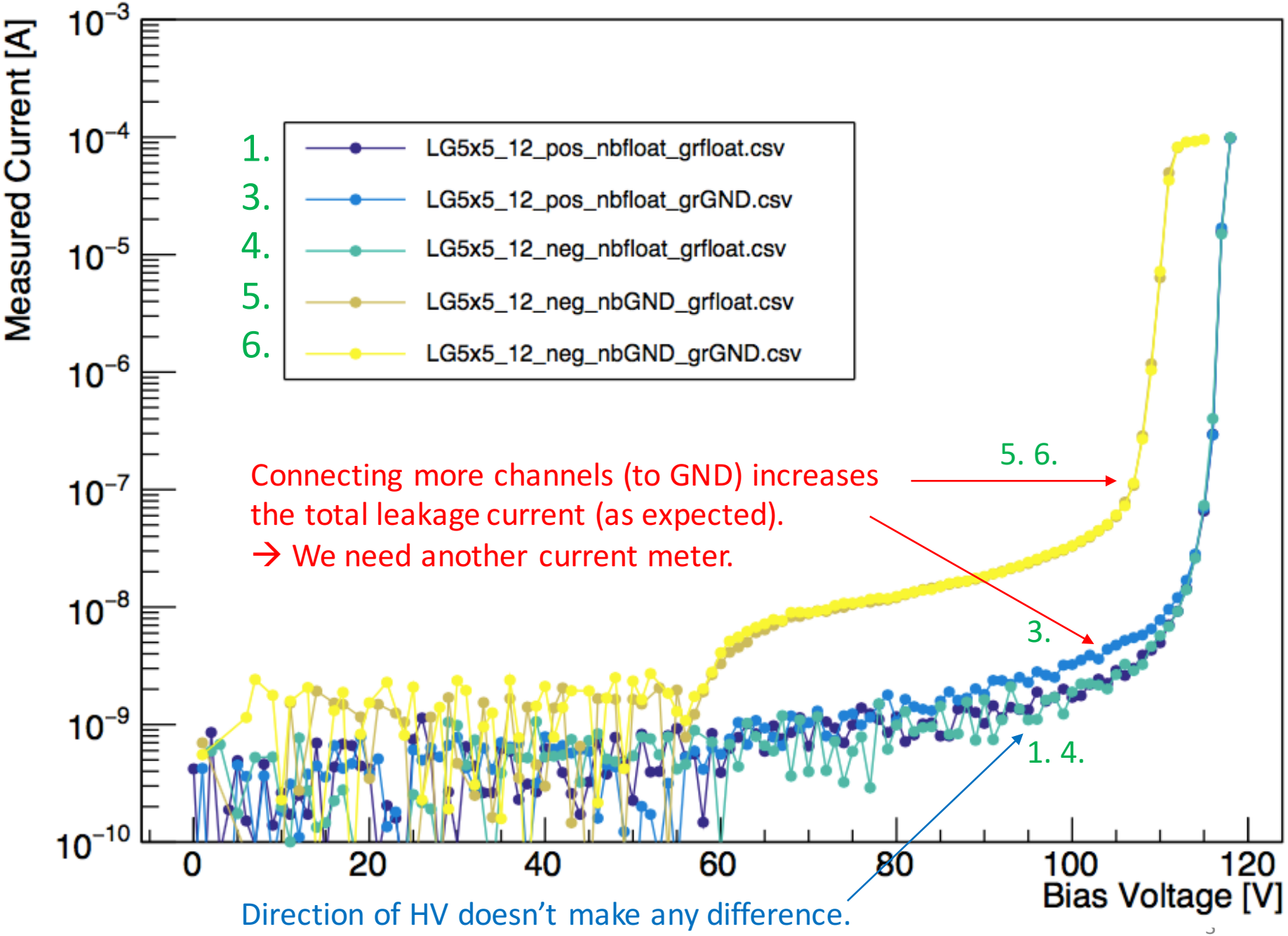
Jan. 10, 2018

I-V test on 5x5 array with probe card

- Test settings
  1. Positive HV on top + Neighbor floating + GR floating
  2. Positive HV on top + Neighbor GND + GR floating
  3. Positive HV on top + Neighbor floating + GR GND
  4. Negative HV on back + Neighbor floating + GR floating
  5. Negative HV on back + Neighbor GND + GR floating
  6. Negative HV on back + Neighbor floating + GR GND

(2) didn't work.
Observed an large leakage current when a small voltage is applied.




Measured Current [A]
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{-8}
10^{-9}
10^{-10}
0
20
40
60
80
100
120
Bias Voltage [V]
1. LG5x5_12_pos_nbfloat_grfloat.csv
3. LG5x5_12_pos_nbfloat_grGND.csv
4. LG5x5_12_neg_nbfloat_grfloat.csv
5. LG5x5_12_neg_nbGND_grfloat.csv
6. LG5x5_12_neg_nbGND_grGND.csv
Connecting more channels (to GND) increases the total leakage current (as expected).
→ We need another current meter.
5. 6.
3.
1. 4.
Direction of HV doesn't make any difference.

Towards C-V measurements

bias adapter

probe station

LGAD sensor

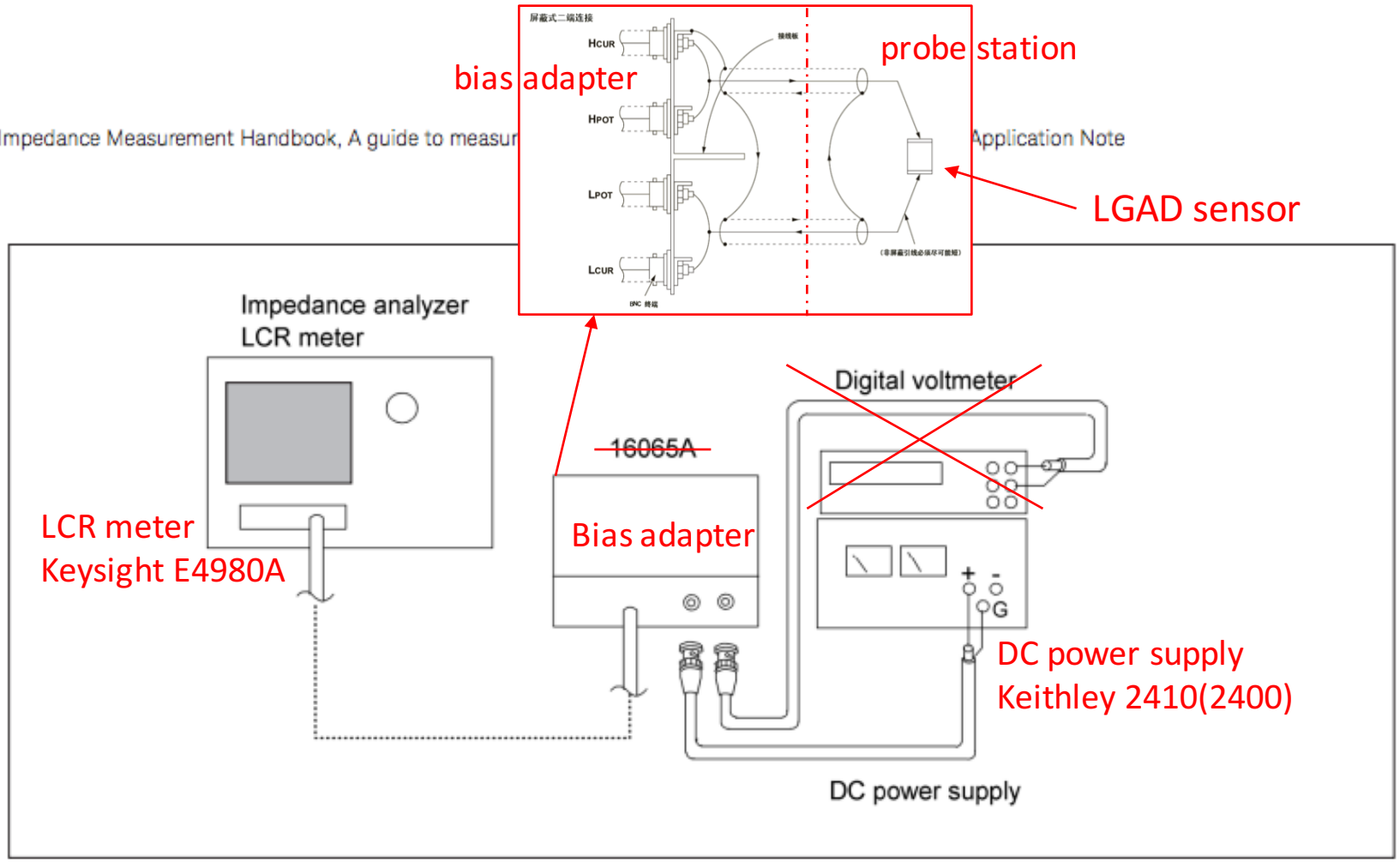
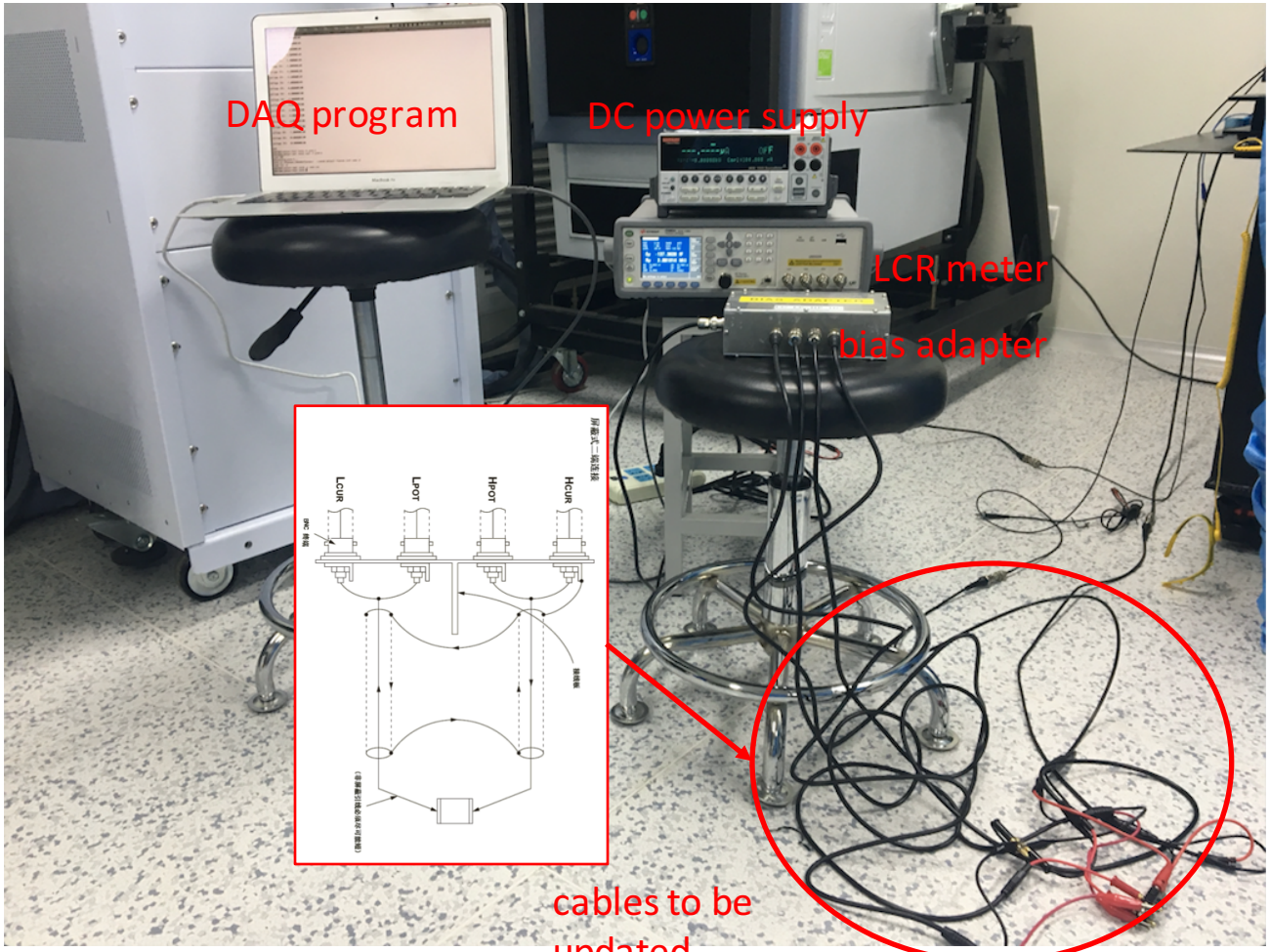


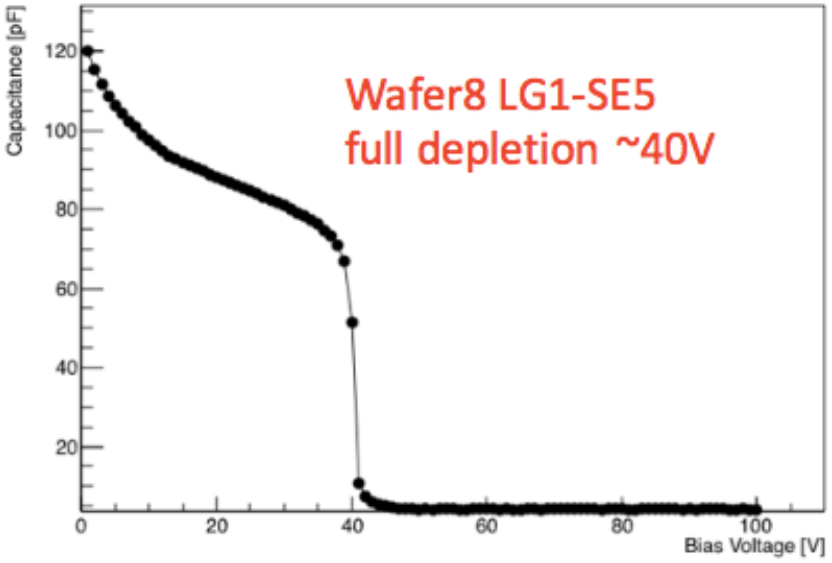
Figure 5-45. External DC bias measurement setup

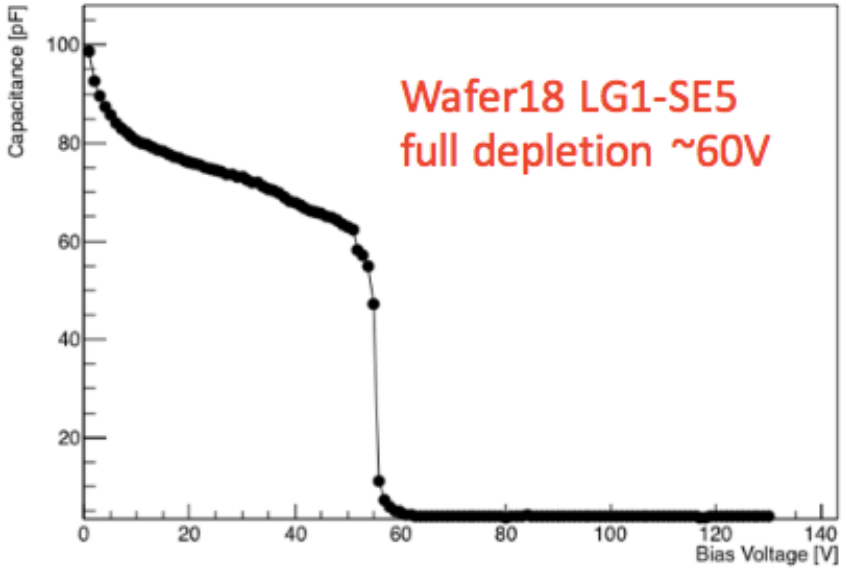
Towards C-V measurements



A first look at the C-V curves

- Keithley 2410 source meter to provide DC bias to the back of the sensor.
- Keysight E4980 LCR meter:
  - f = 1MHz recommended frequency: 10kHz
  - V_{AC} = 100mV
- We tested two HPK single pad sensors
- More C-V results will come soon.





Preparation towards large scale tests

- Common issues
  - A common PC to install the DAQ program?
  - Data storage?
    - OneNote document to store the summary table (depletion voltage, capacitance…) .
    - Any common area to store the raw data?
- C-V measurement specific
  - Readiness of the new clean room?
    - Can we use the new probe station for C-V tests?
  - Readiness of the new probe station
    - A Windows PC to install the monitoring software of the probe station.
    - No cable connection to the chunk. Currently using one needle to touch chunk and apply HV.
  - Need an additional source meter. Or share one source meter between C-V tests and probe card I-V tests.