Testing Fermilab PoF system in warm and LAr II

(Nov 17,2020)

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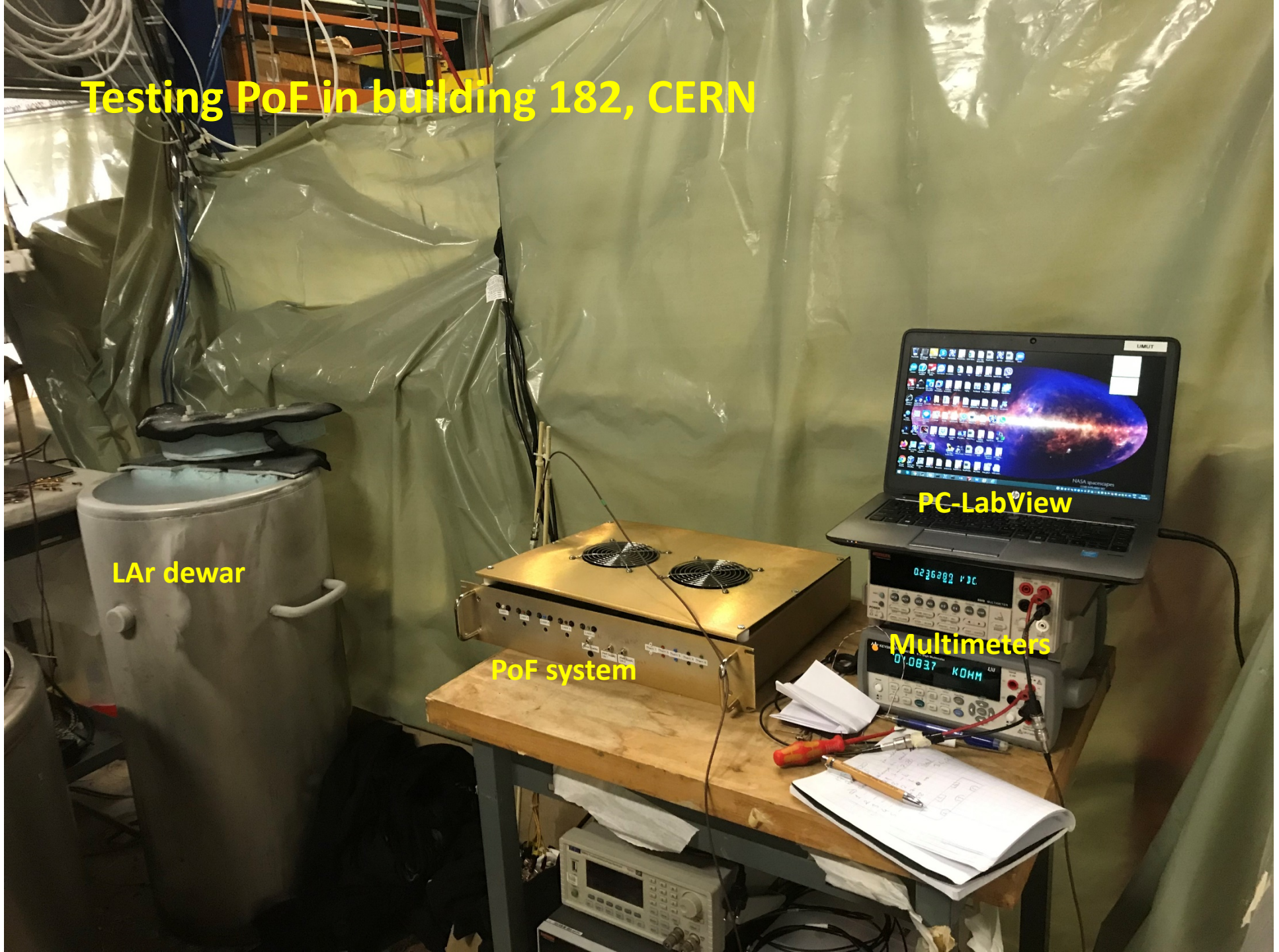
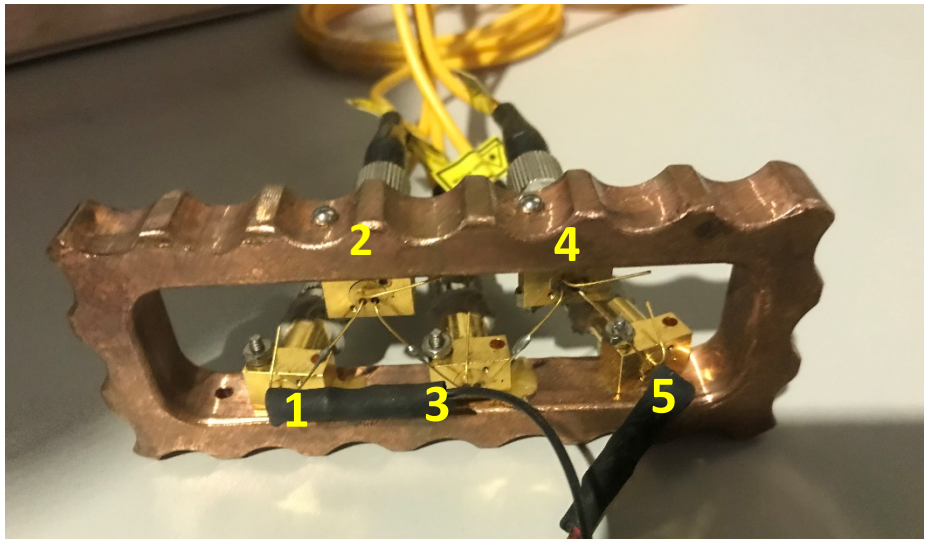

Testing PoF in building 182, CERN
LAr dewar
PoF system
PC-LabView
Multimeters

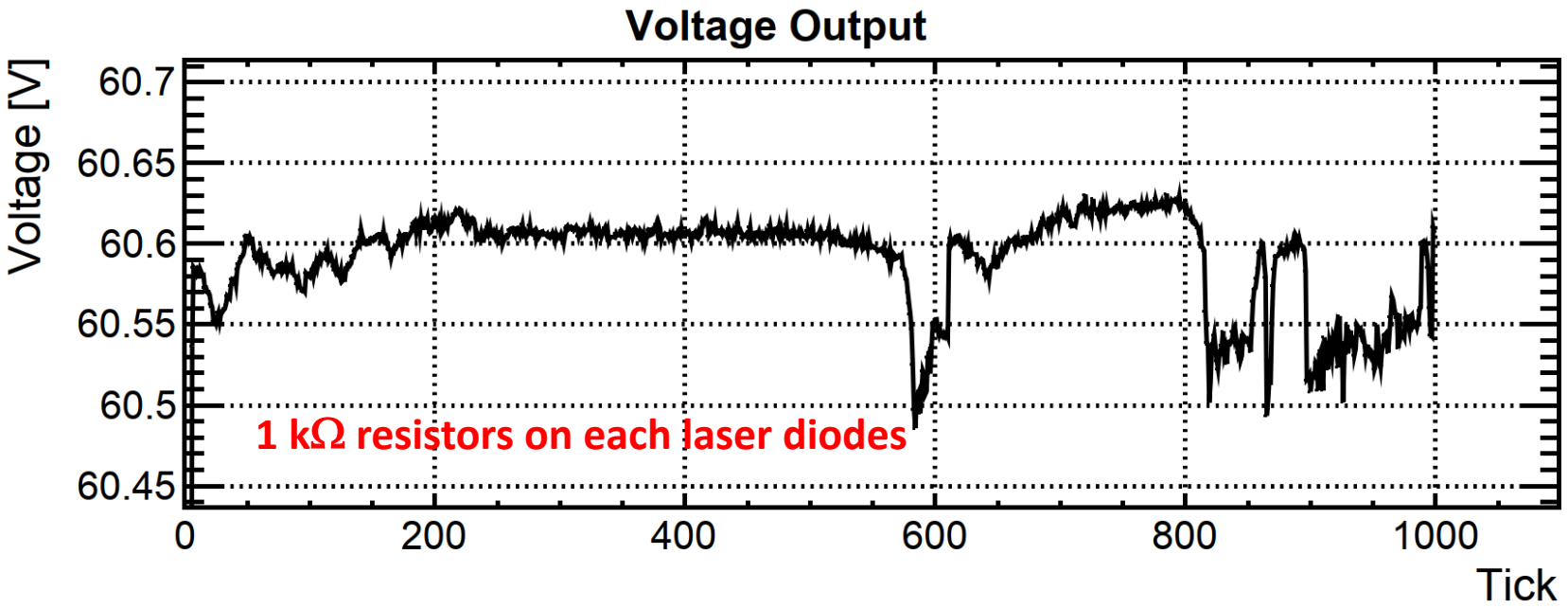
Checking individual output on each power converters

Power converter	Resistors	Voltage output
1	2.2 kΩ	8.02
2	1 kΩ	6.43
3	2.2 kΩ	8.32
4	1 kΩ	5.47
5	1 kΩ	7.58
Five in series		34.54



- We wanted to see differences among power converters.
- See slides on the test performed on November 16: https://cernbox.cern.ch/index.php/s/UjLWSss9CCVUtoF
- We saw strong dependence on voltage output w.r.t. heat dissipations on power converters
- We could not get stable voltage on room temparture.

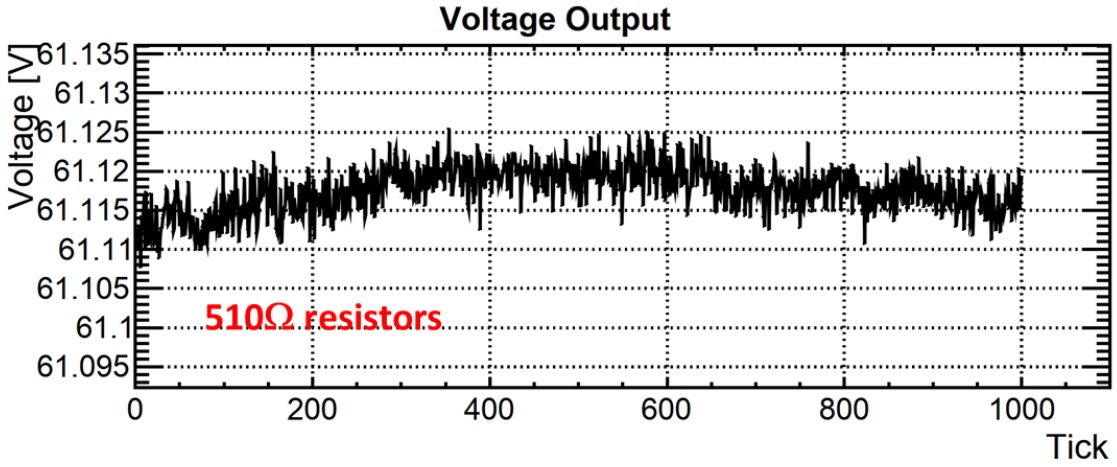
Liquid Argon test:

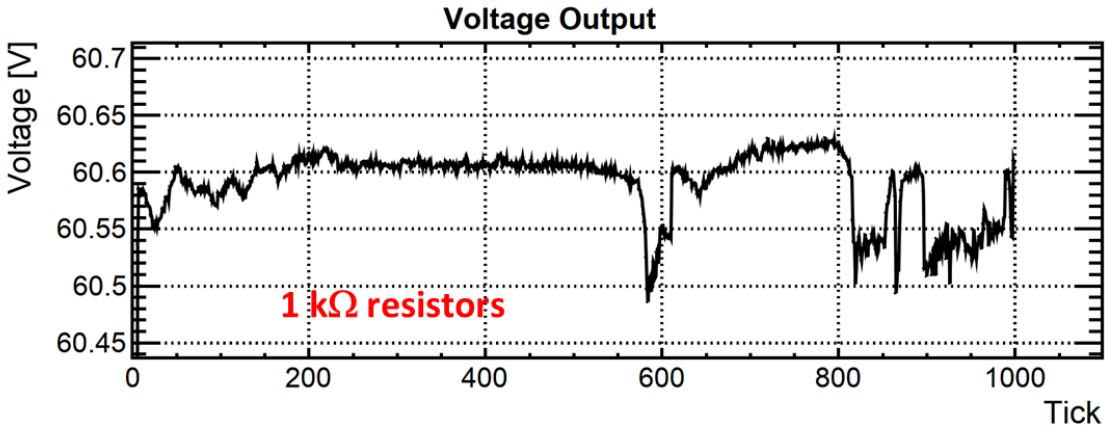


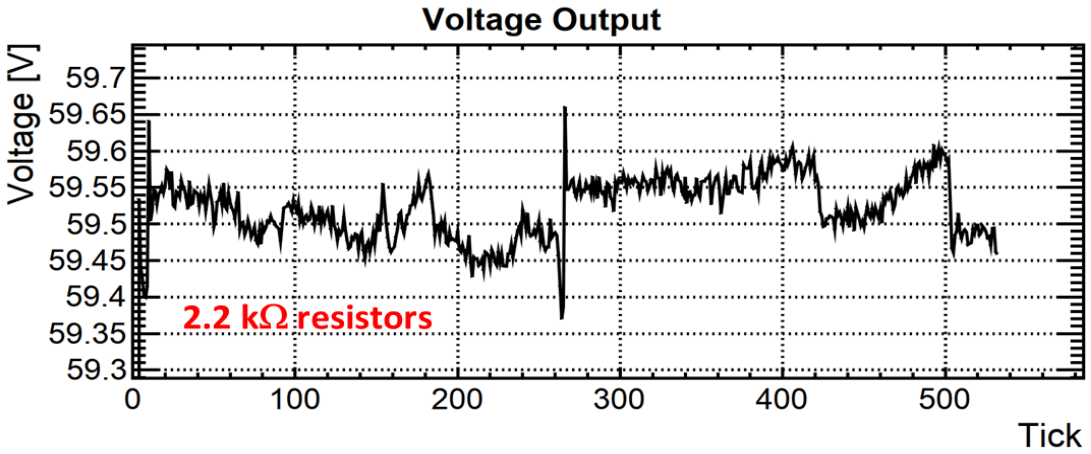
- **Once we turned on the PoF system, LAr starts boiling! We also see increase of the bubbles in time (that could explain 100 mV drops on voltage output!).**
- **When PoF is OFF, the bubbles disappear and argon gets quite and stable again. See movie in the following link ON-OFF PoF system):**
- **https://cernbox.cern.ch/index.php/s/CRcj75RwpR3sVpR**

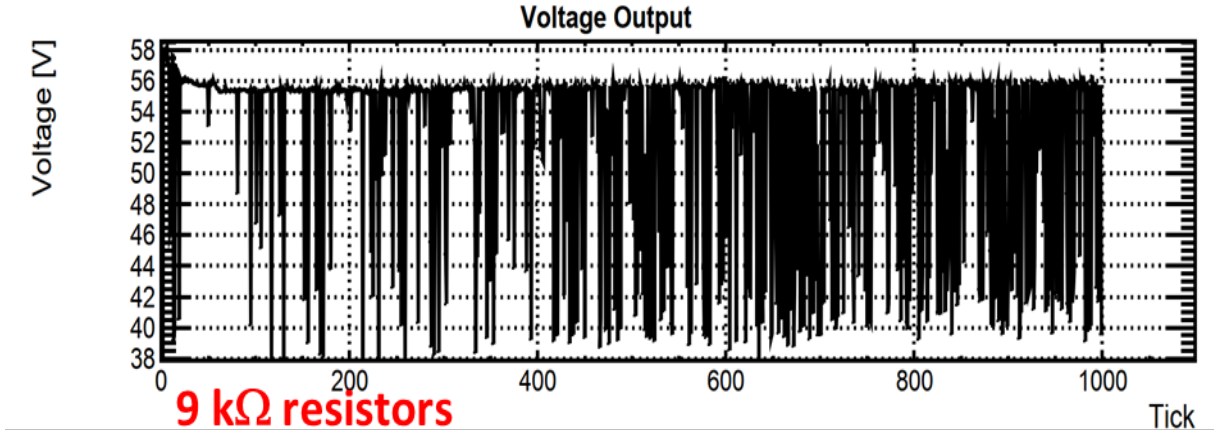
- **We add more Argon to increase the liquid level, as a results an amount of bubble decreased a bit.**

Voltage output dependence on changing resistors of five laser diodes:









For all measurements we have seen bubbles, the higher resistors used, the more bubbles produced.

Results:

Resistors on laser diode	Voltage output (5 PPC in series)	Bubbles
510 Ω	61.1	Yes *
1 kΩ	60.6	Yes **
2.2 kΩ	59.5	Yes ****
9 kΩ	Instable	Yes ******

- Except for 9 kΩ resistors, we saw about ~100mV fluctuations on the output voltage.
- Need to discuss about the results we get.
- More photos and videos could be found in:
https://cernbox.cern.ch/index.php/s/yw0sLUI5IOMXhIj
- More slides on the tests performed on 13 November and 16 November can be found in
https://cernbox.cern.ch/index.php/s/UjLWSss9CCVUtoF
- Continue LAr tests to understand more the system