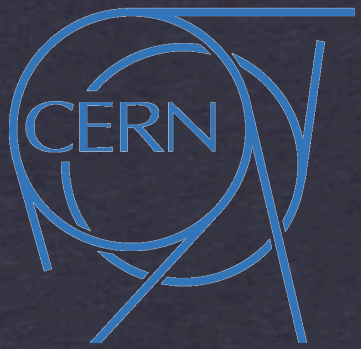
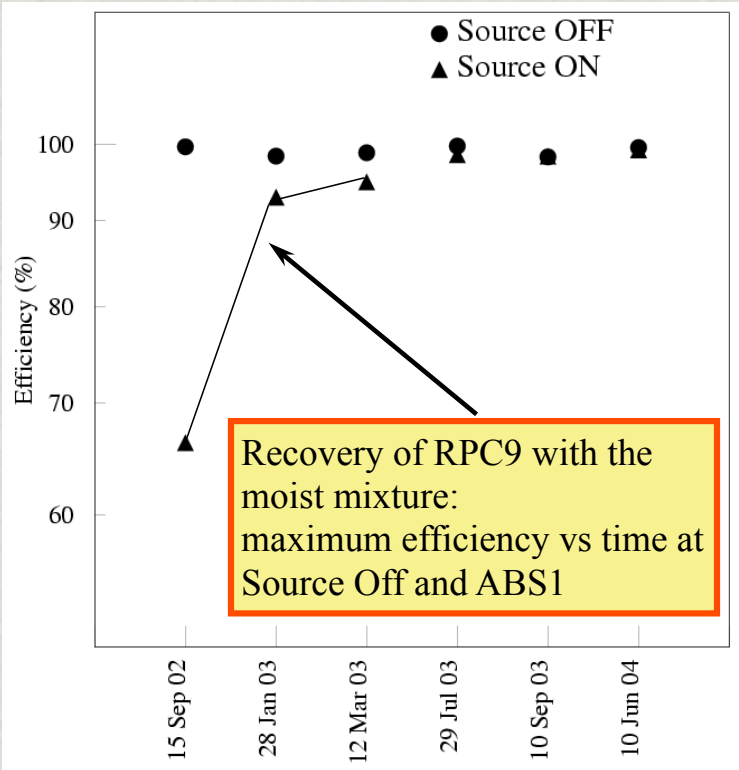


Resistivity: preliminary results

Roberto Guida, Beatrice Mandelli

Resistivity 2002-2004

- RPC community discovered that dry gas produce an increase in the bakelite.
- Higher resisitivity: lower rate capability, i.e. lower efficiency at high rate.
- Started to flow humidifier gas (40-50% RH).
- Detector efficiency recovery



- Bakelite resistivity

RPC #	Initial resistivity (10^{10} Ωcm)	Final resistivity (10^{10} Ωcm)
1	4	20
3	6	45
5	3	55
6	2	20
7	6	25
8	5	14
9	2	11
A	4	17
B	4	23
C	5	40
D	4	37
26-UP	5	21
26-DW	3	22
45-UP	2	10
45-DW	3	12

Increased by a factor 5÷10

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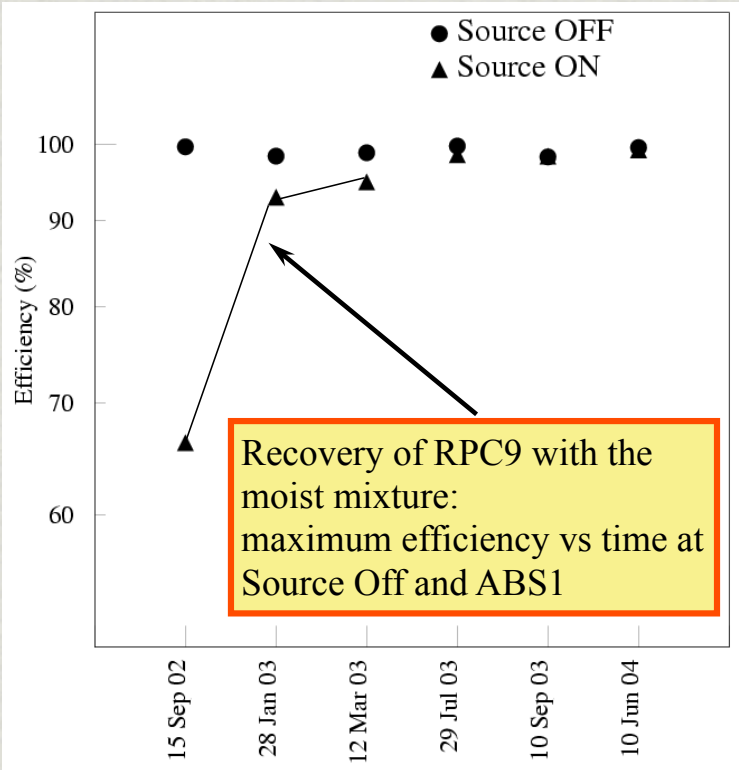

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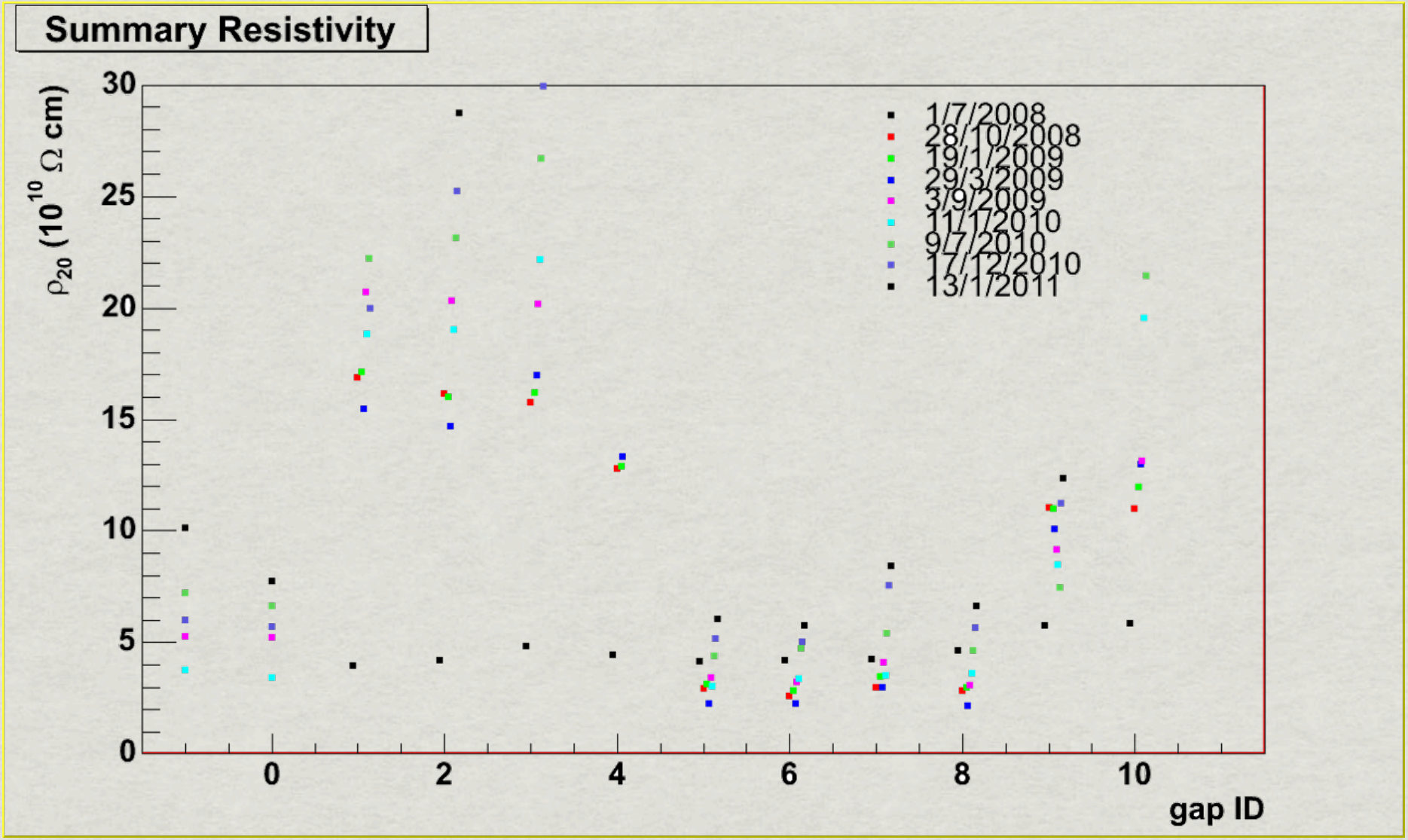
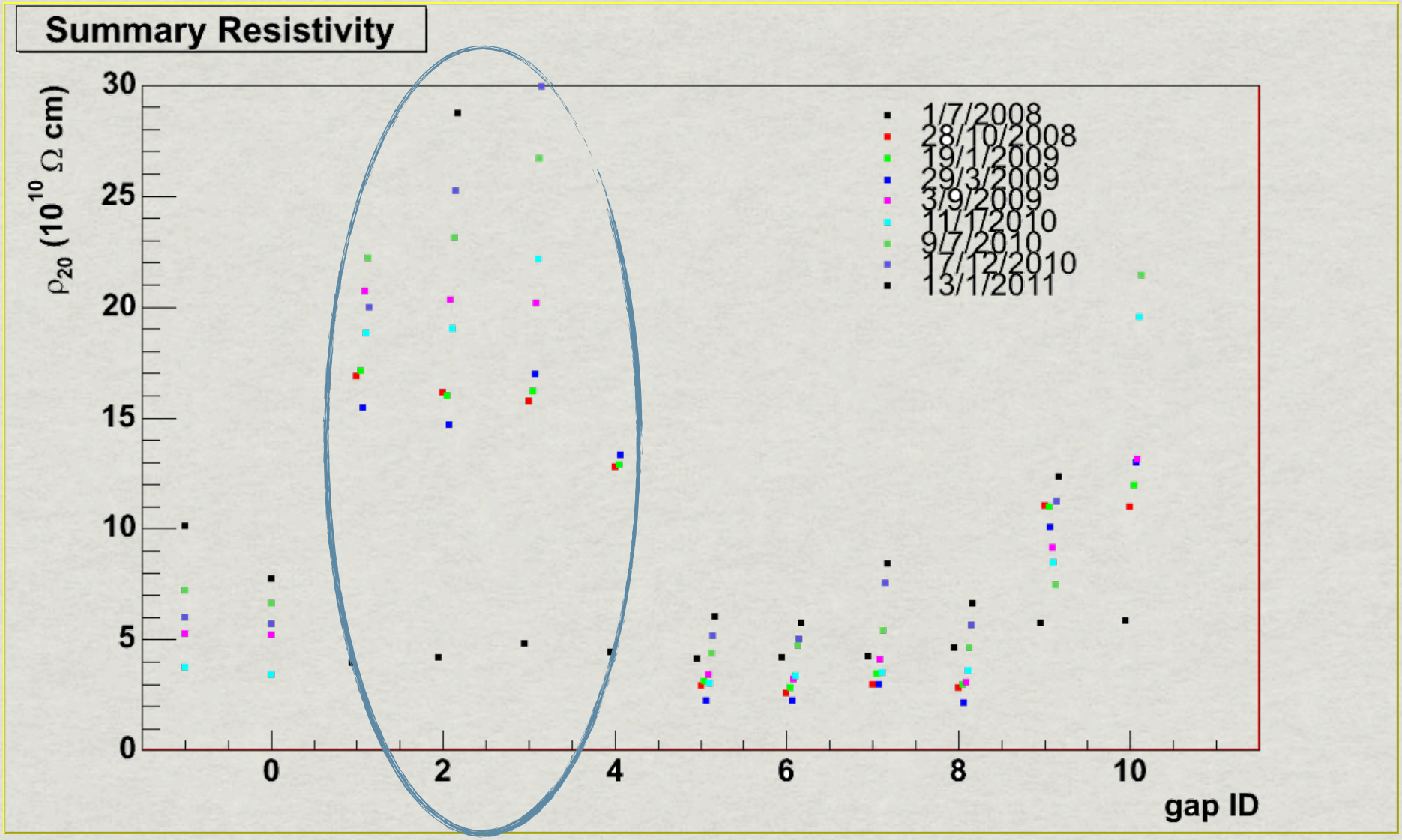
Resistivity **OLD** GAPs 2008-2011



Resistivity **OLD** GAPs 2008-2011



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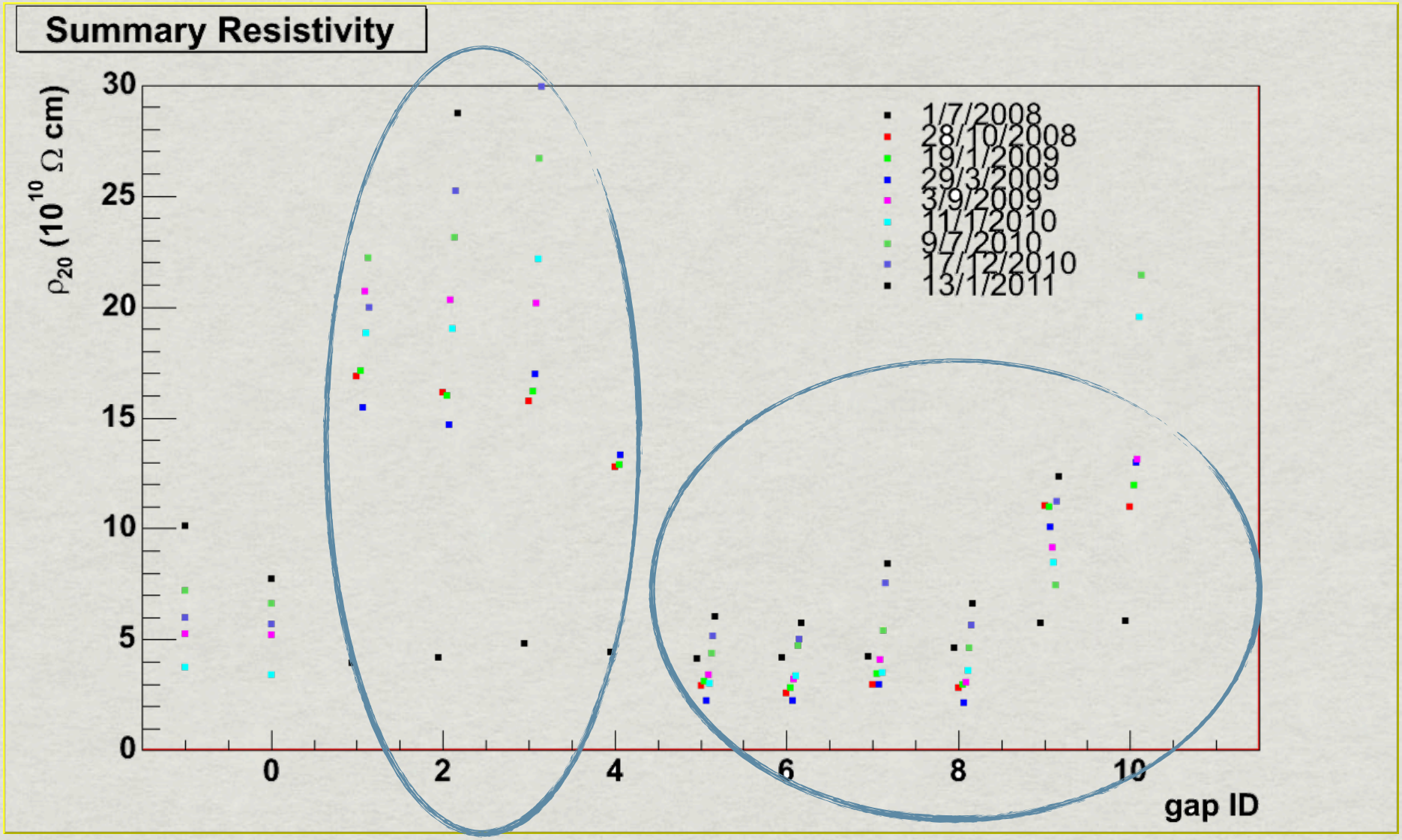
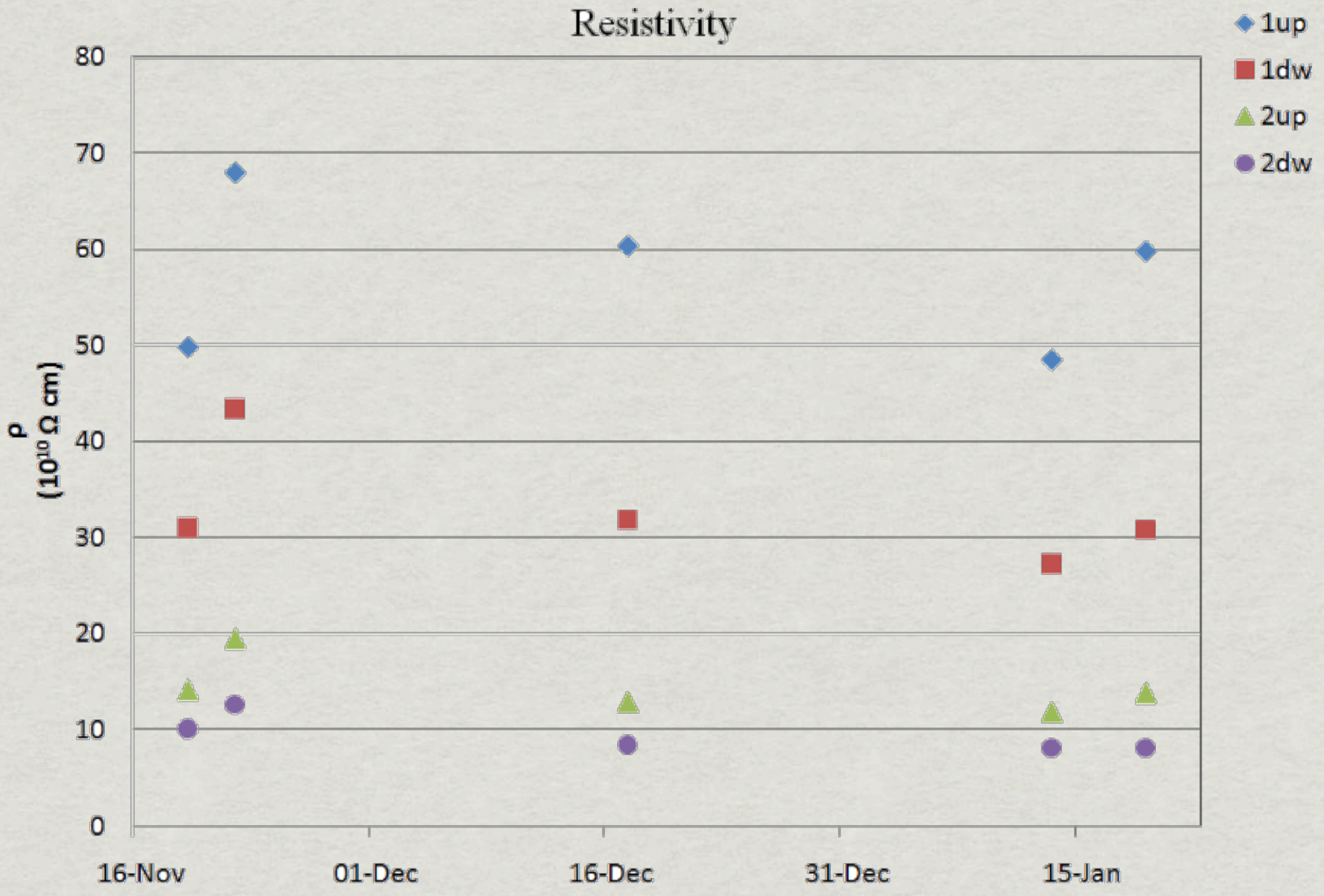


Resistivity **NEW** GAPs 2010-2011



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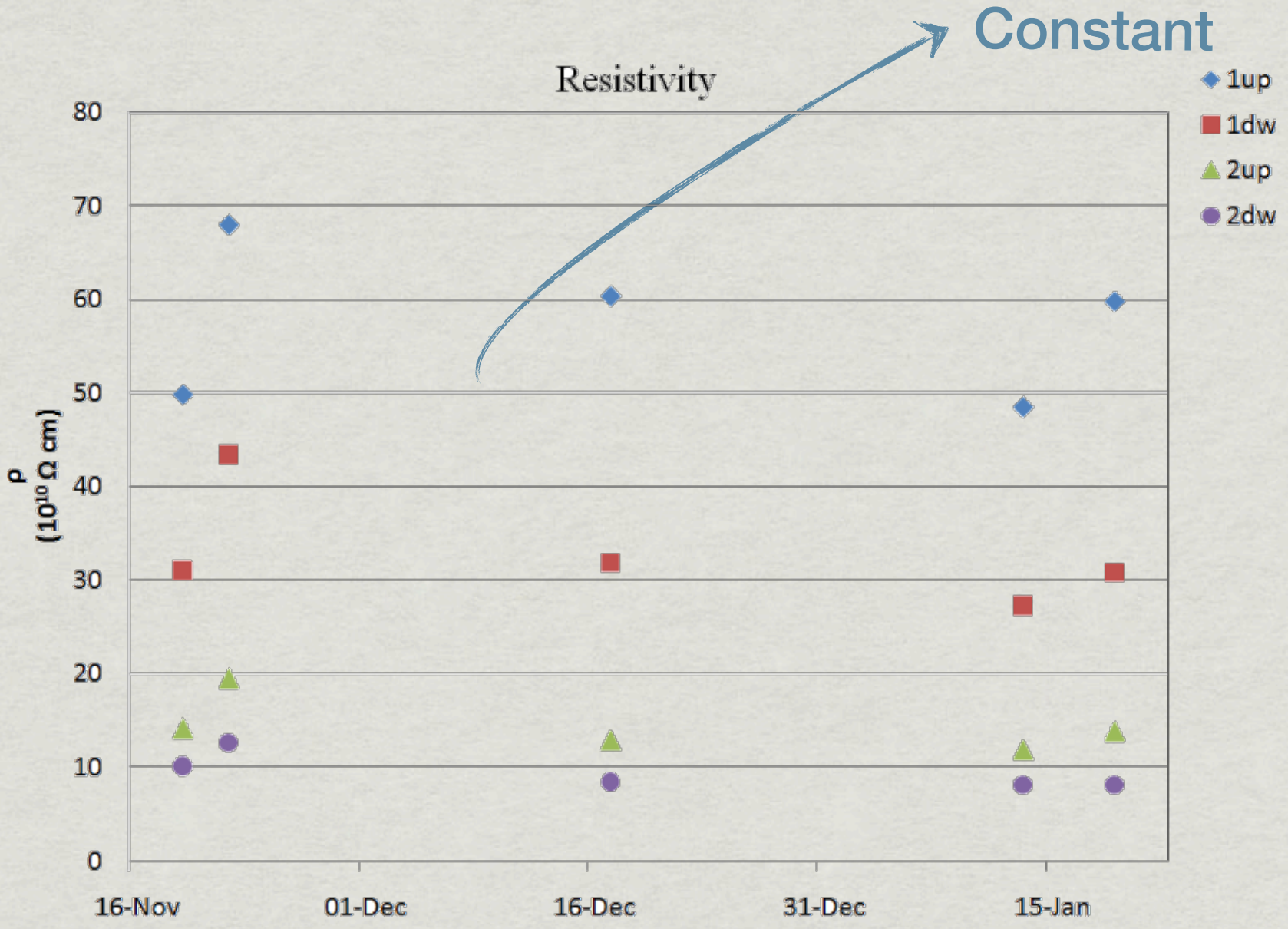
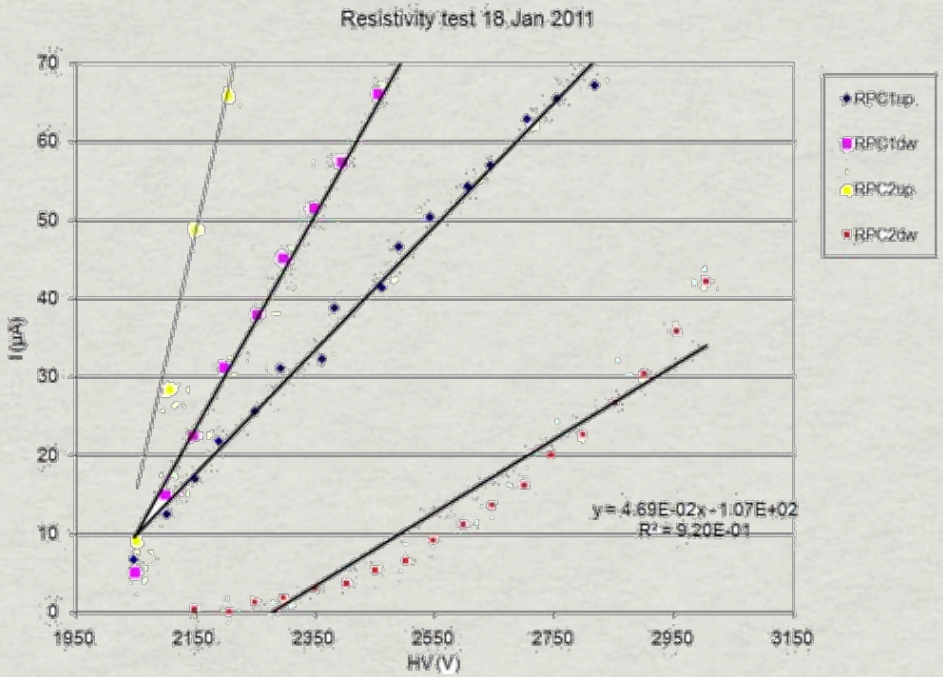


Resistivity **NEW** GAPs 2010-2011

- 18 Jan 2011



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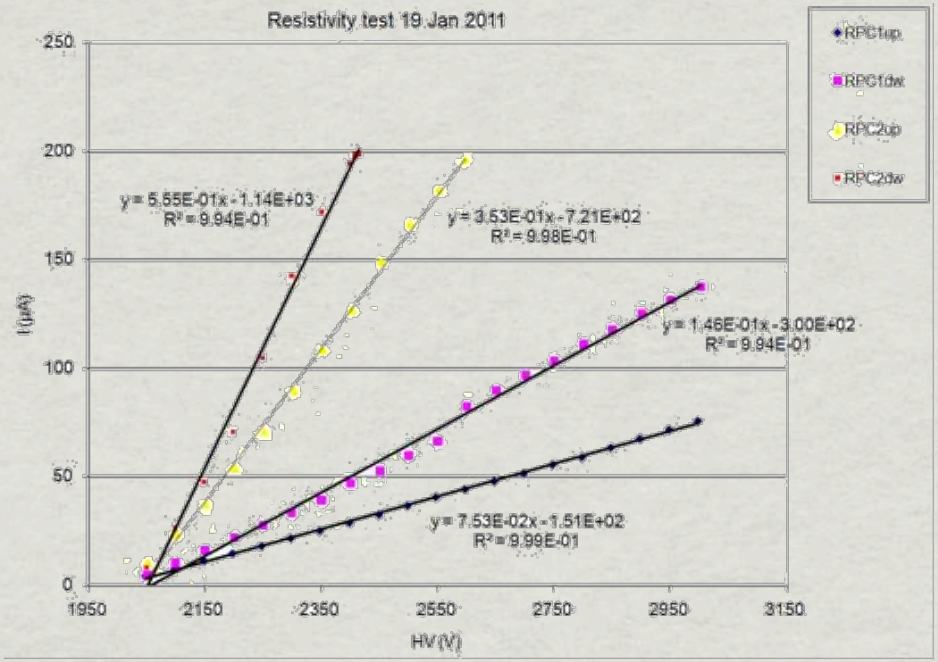

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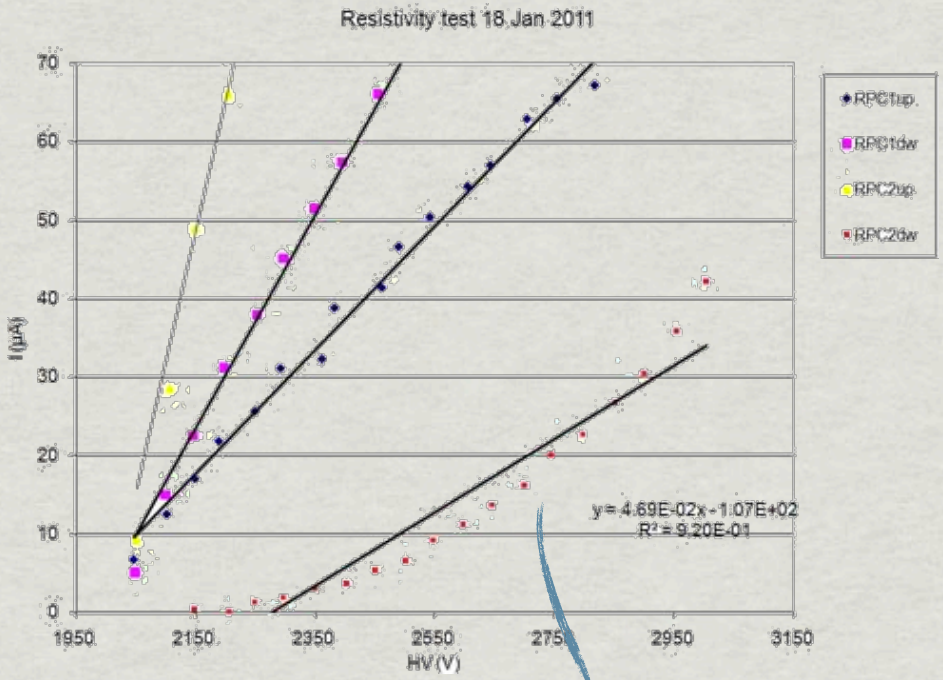

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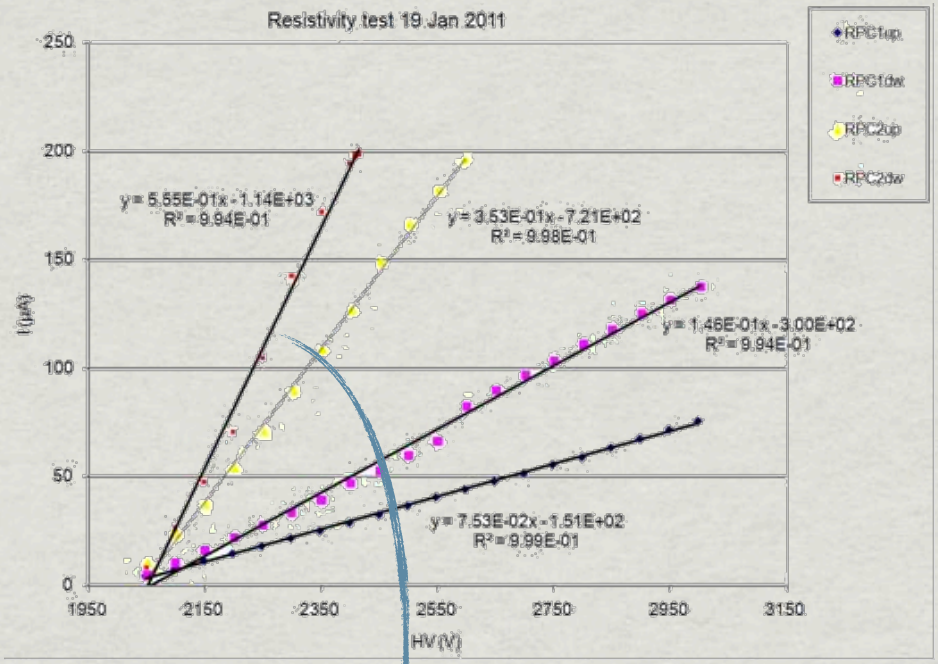

$96*10^{10}\ \Omega$ cm

$8*10^{10}\ \Omega$ cm

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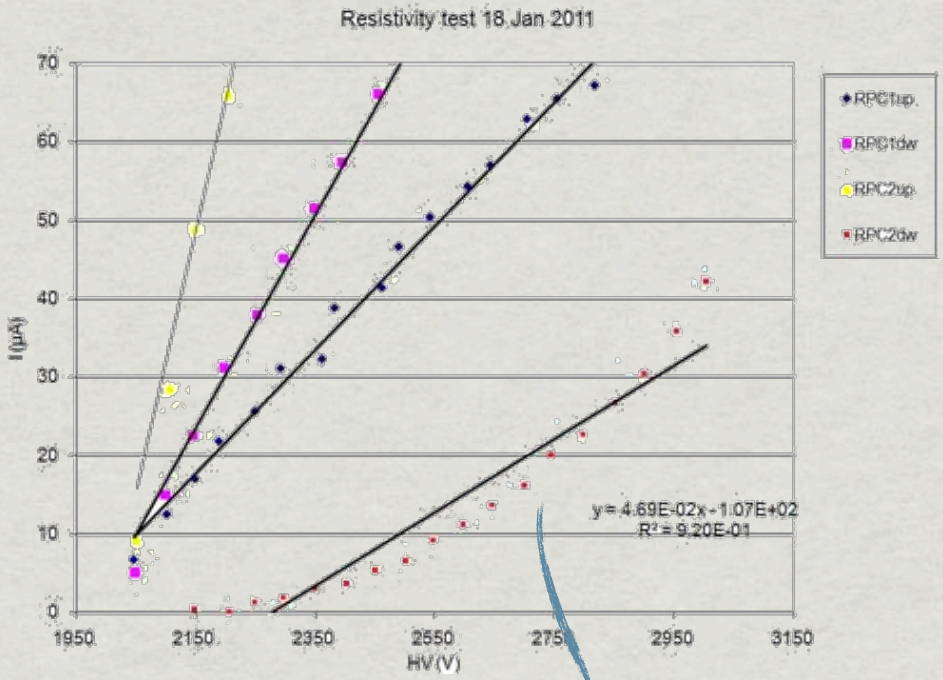

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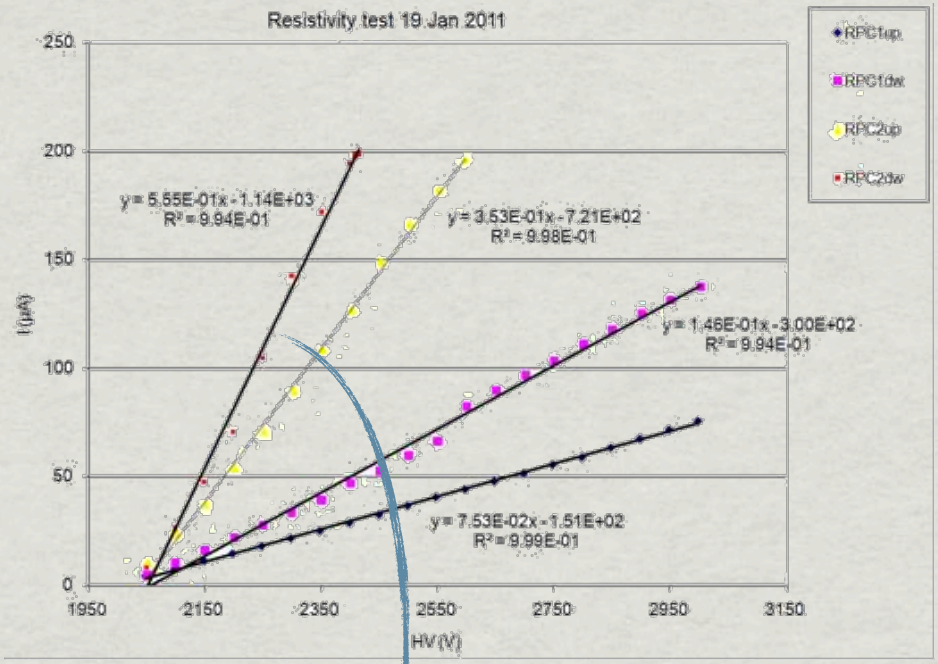
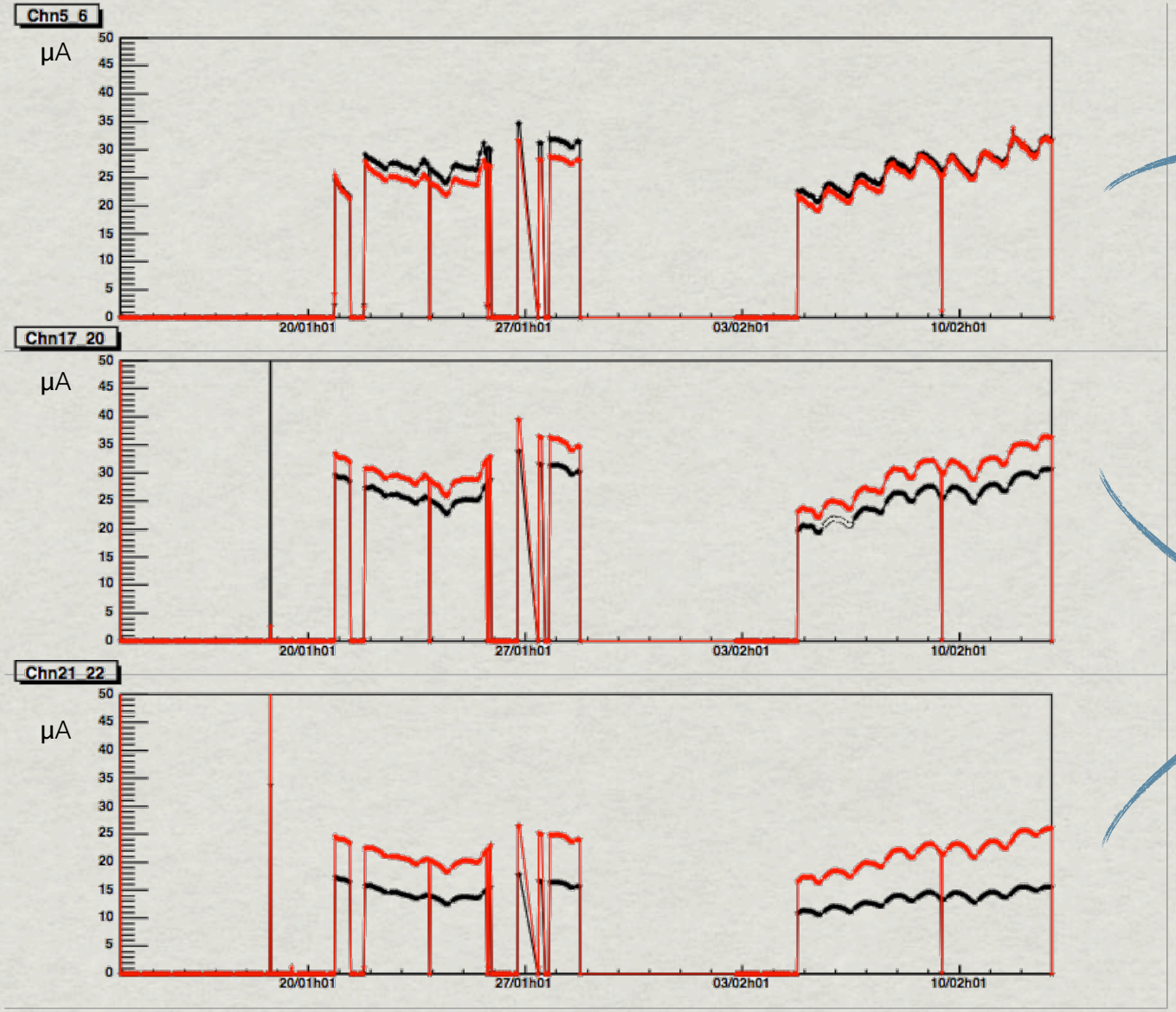


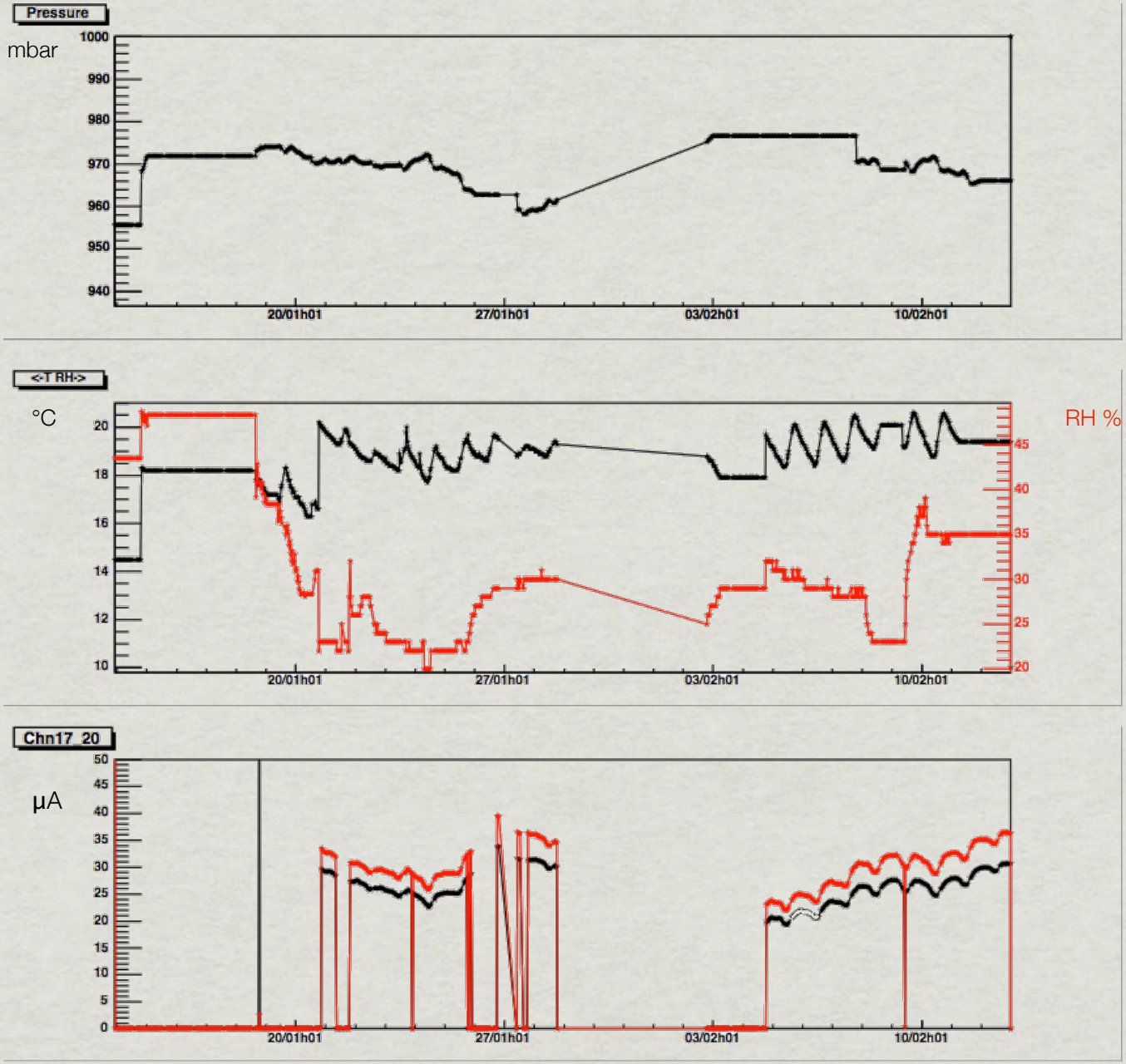
$96*10^{10}\ \Omega$ cm ⟷ $8*10^{10}\ \Omega$ cm

- Wrong result: bad gas flow distribution in the gap.
- After one day of flushing the problem disappeared.

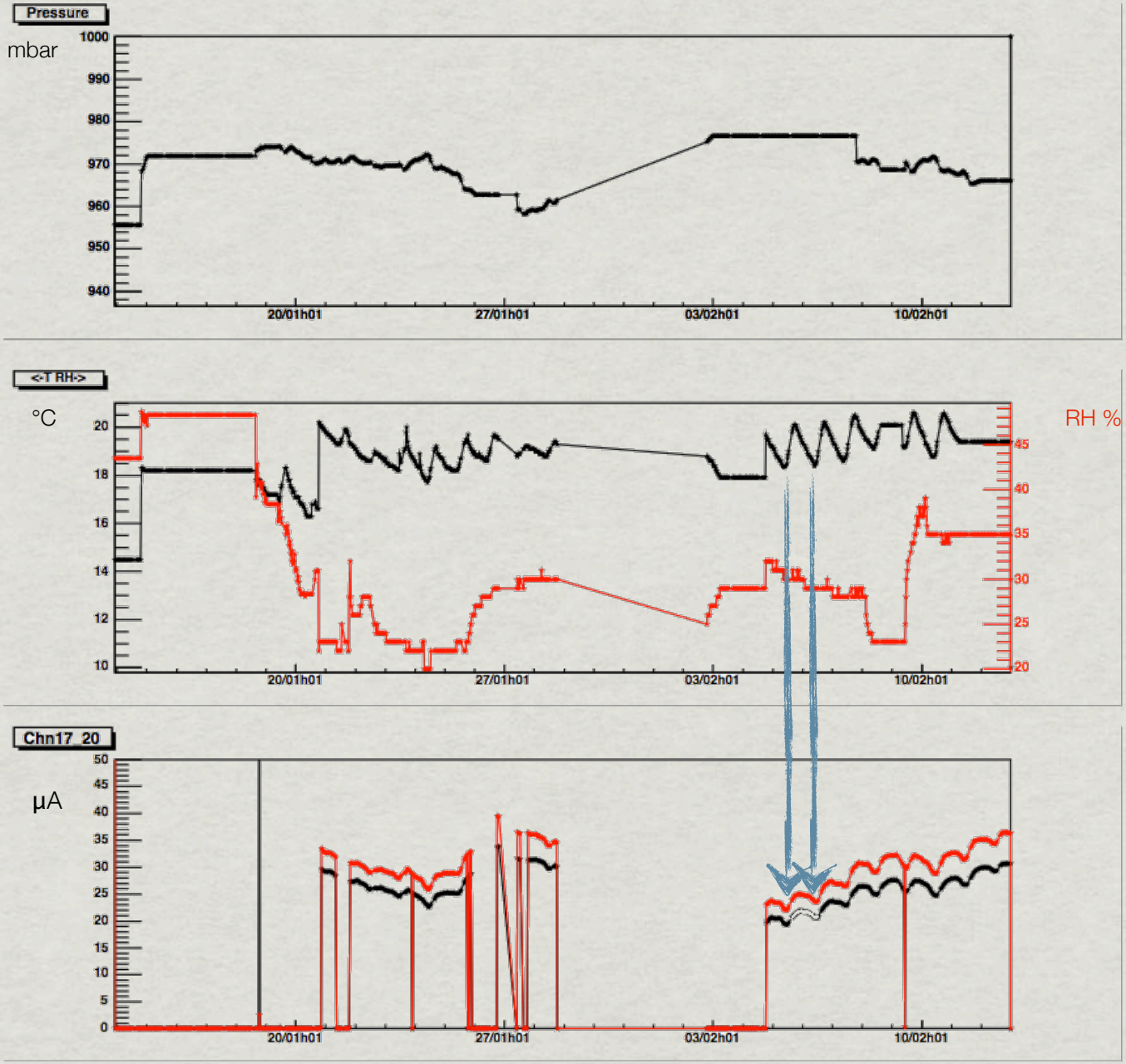
Current trend Jan-Feb 2011



Current trend Jan-Feb 2011



Current trend Jan-Feb 2011



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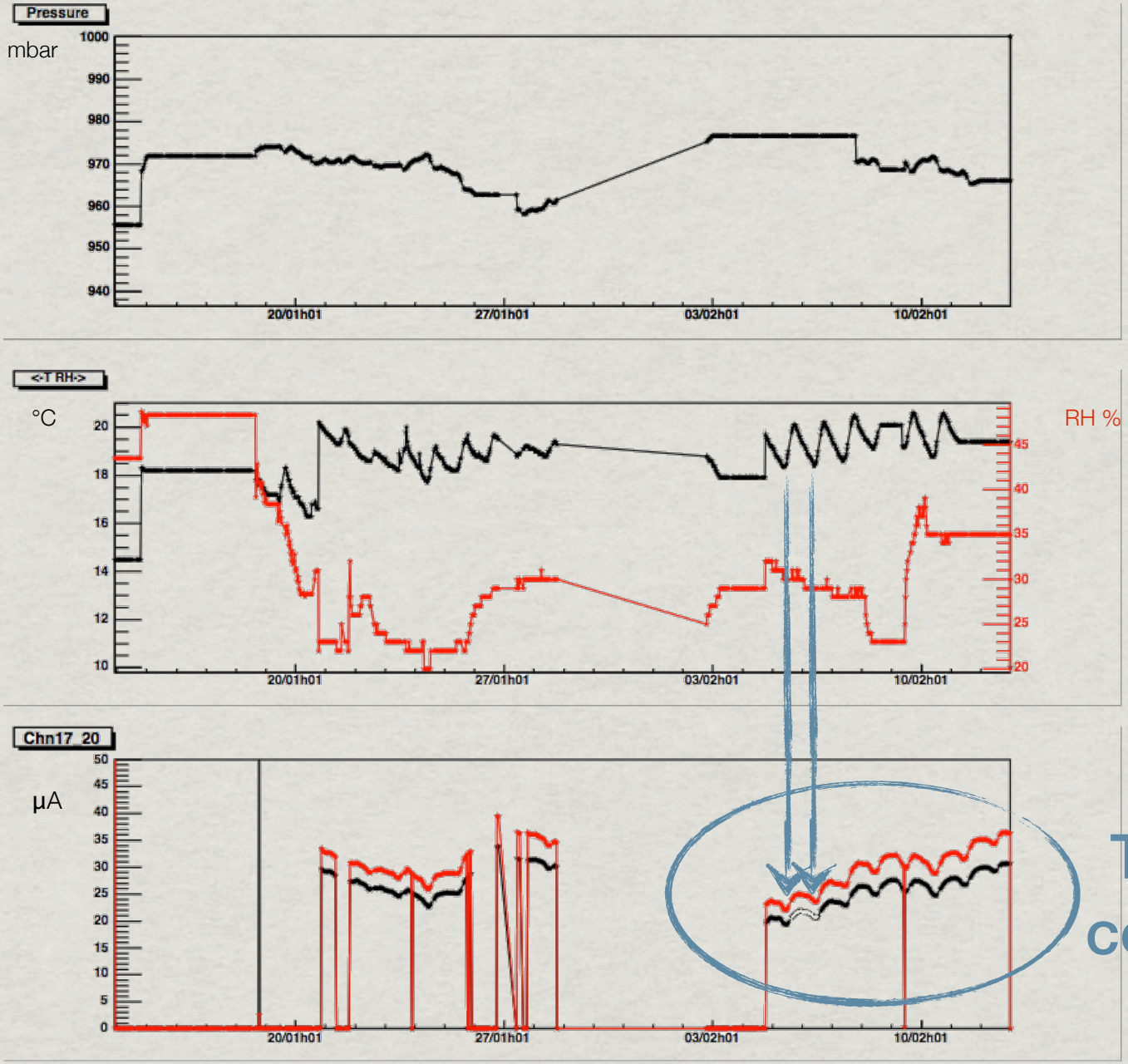

T-current correlation

Conclusion

- An increase in the bakelite resistivity was observed in earlier tests (2002-2004).
- Measuments (2008-2011) performed on old gaps (from CMS first production) confirm the previous results.
- The bakelite resisitivity of the new gaps seems to be constant after about 3 months of operation.
- Detector currents are stable if the effects of enviromental conditions are taken into account.