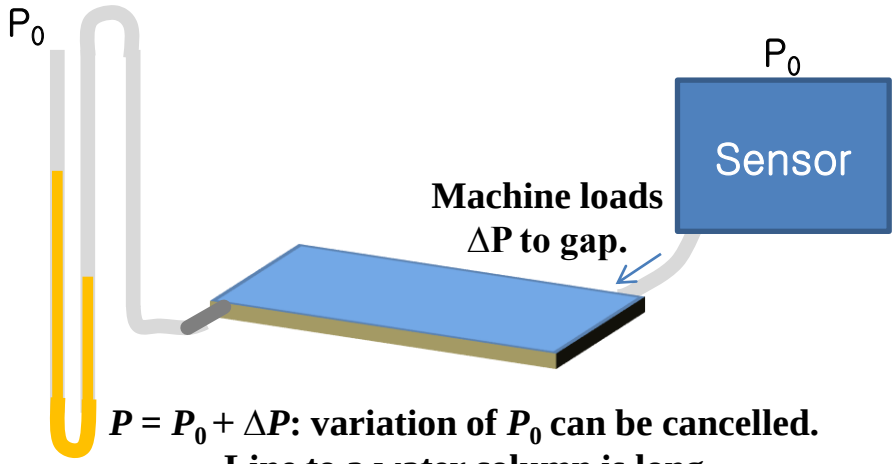
Discussion for QC steps
Database & Leak-pop-spacer tests

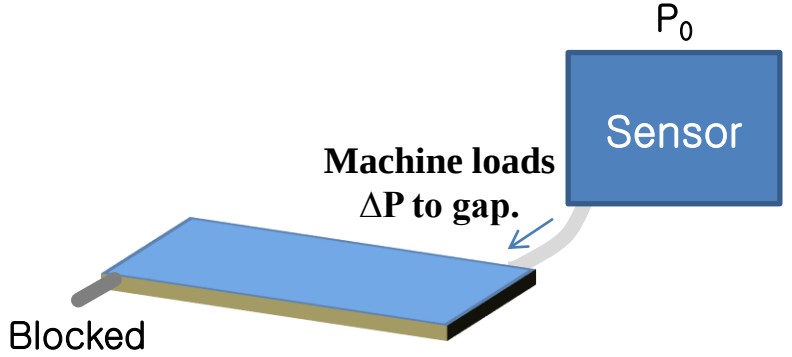
K. S. Lee, S. Park, M. Kang, J. H. Yoon

Data for 13 RE4/2 test gaps in the CMS upscope database.
30 gaps with RE4/2 types with Batch 12 HPLs.
Destroyed ~ 20 gaps to investigate the inside oil condition.

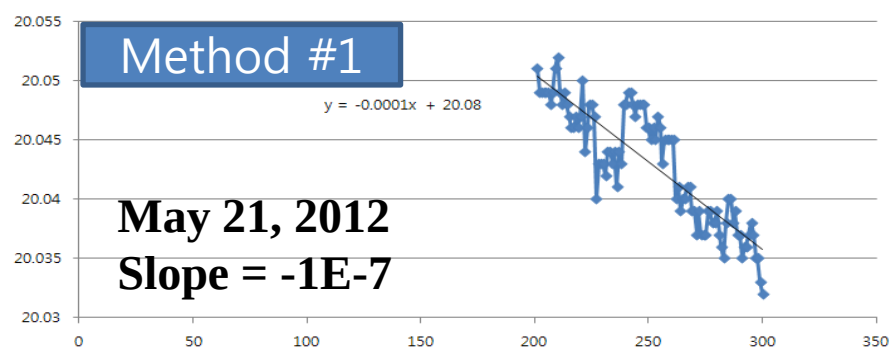
1. Test for leak and pop-spacers, selected one RE4/2 TW gap.

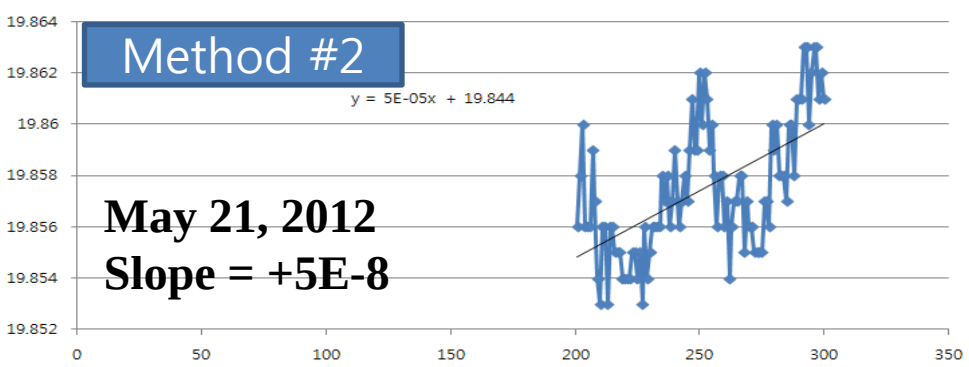


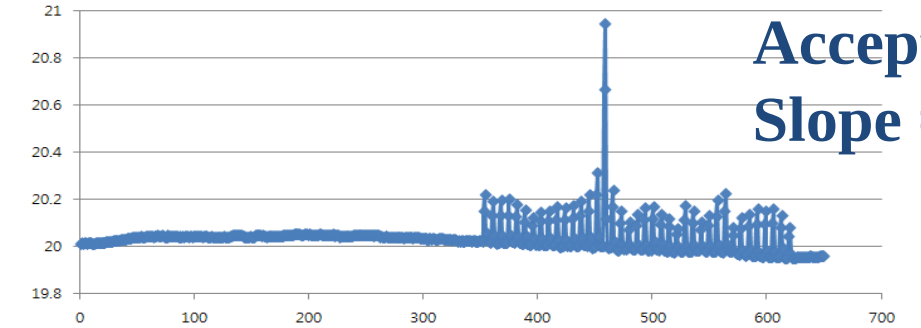
$P = P_0 + \Delta P$: variation of P_0 can be cancelled.
Line to a water column is long
→ more sensitive to T variation



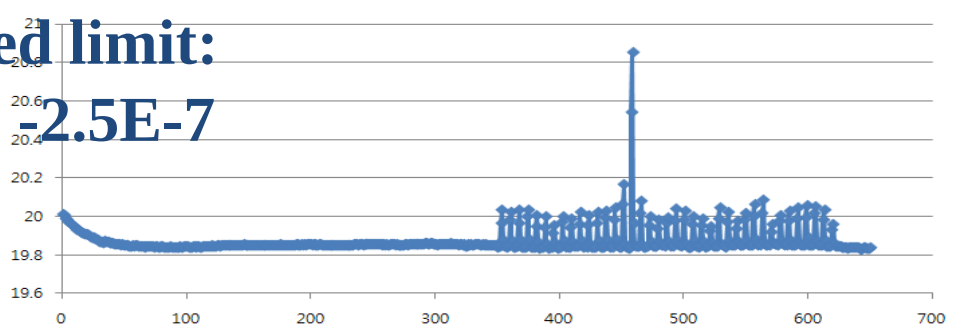
$P = P_0 + \Delta P$: variation of P_0 can not be cancelled.
Short line → less sensitive to T variation

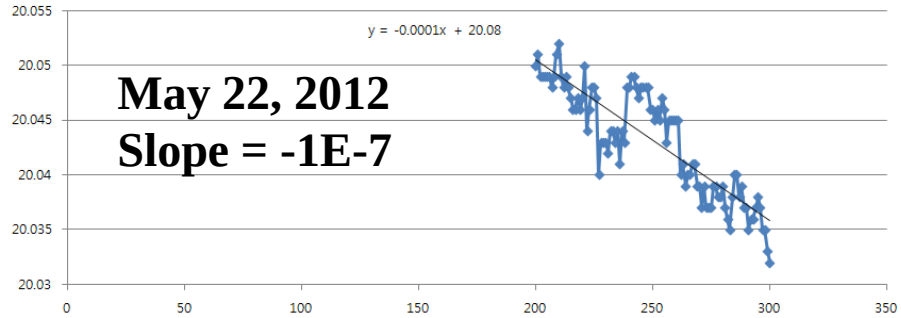


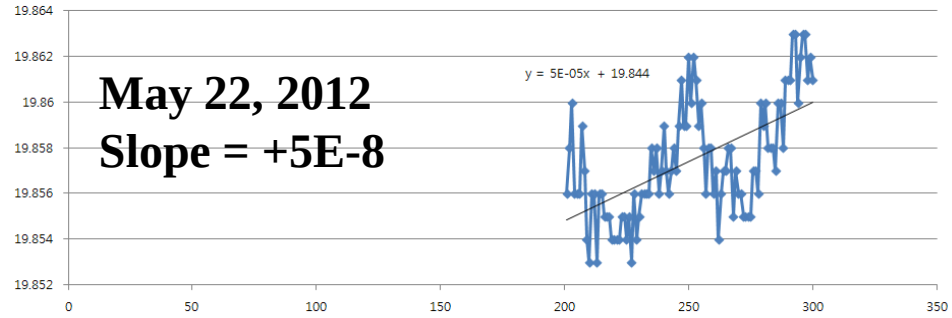


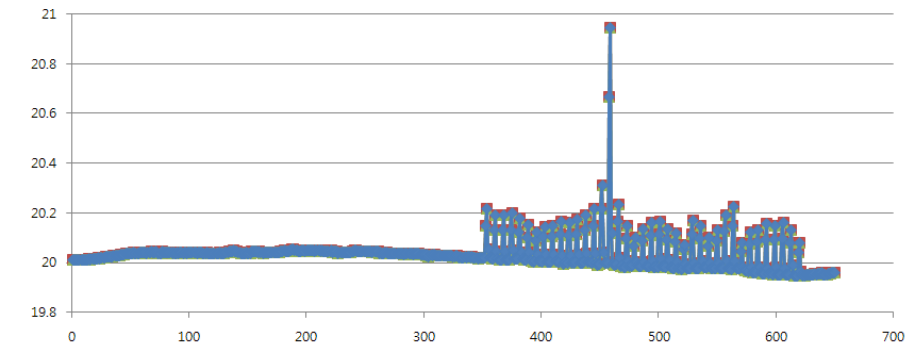


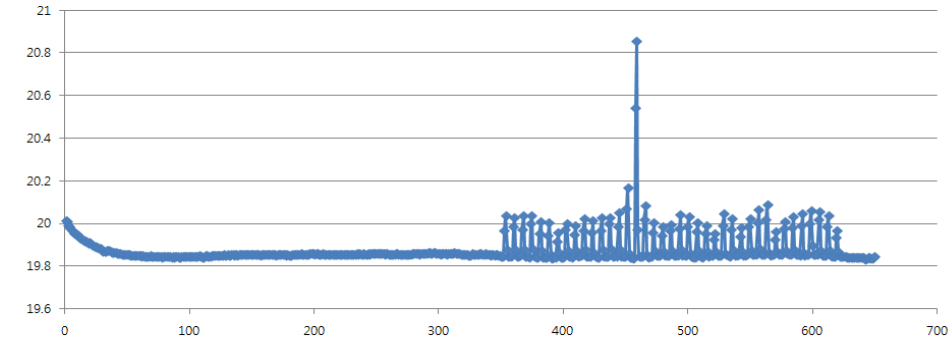
Accepted limit:
Slope = -2.5E-7

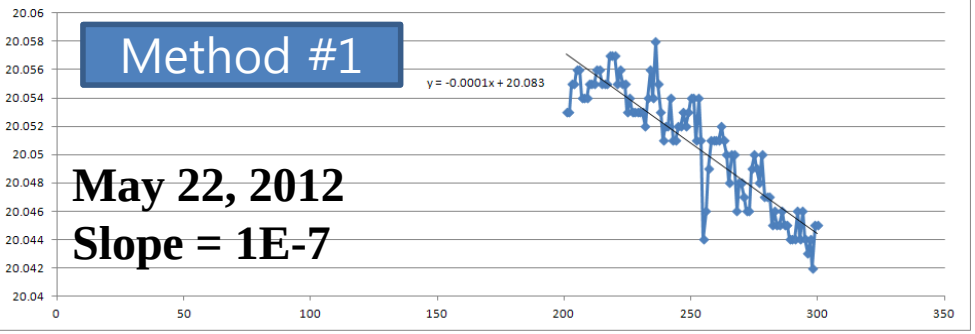


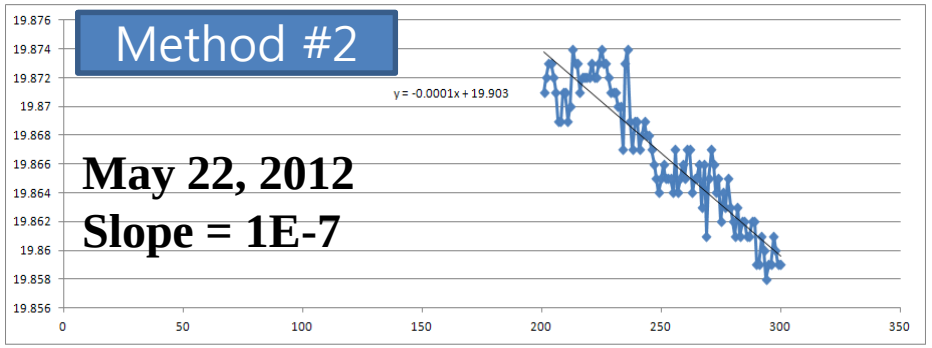


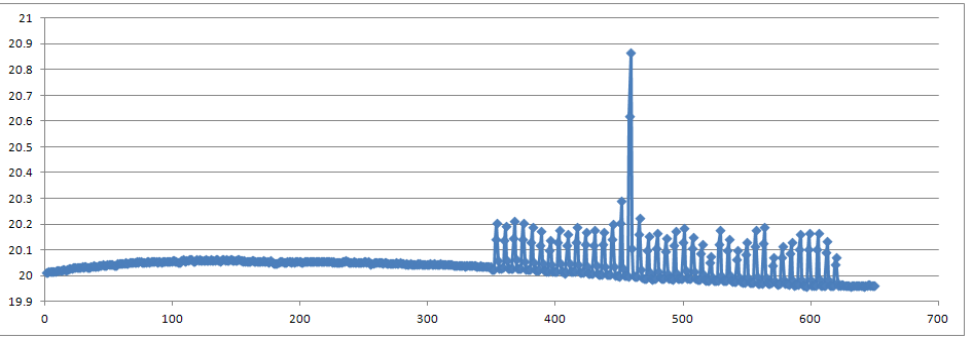


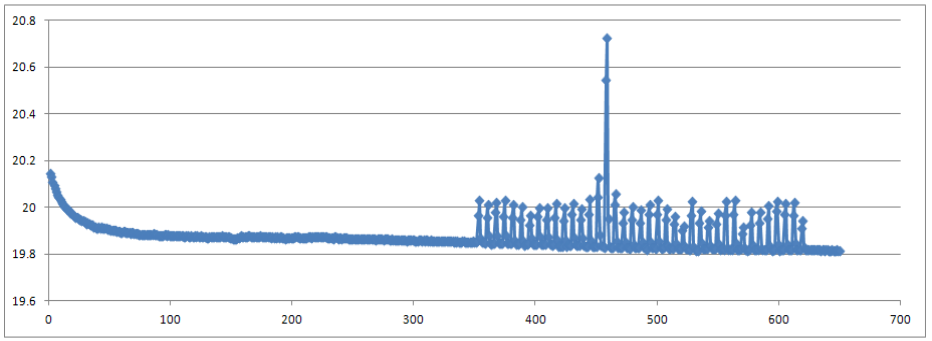


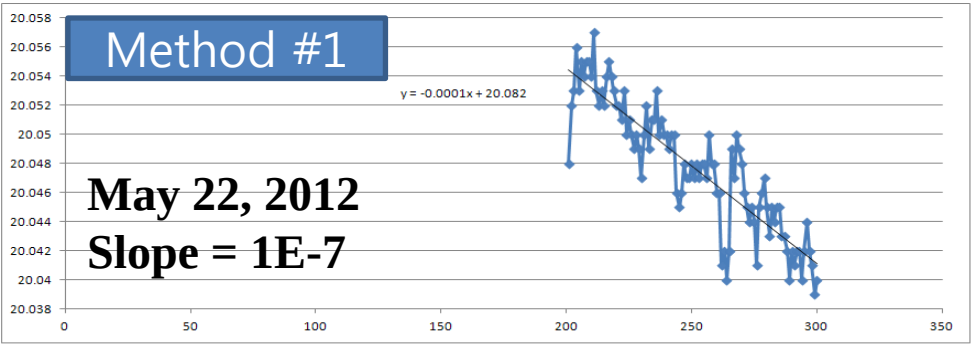


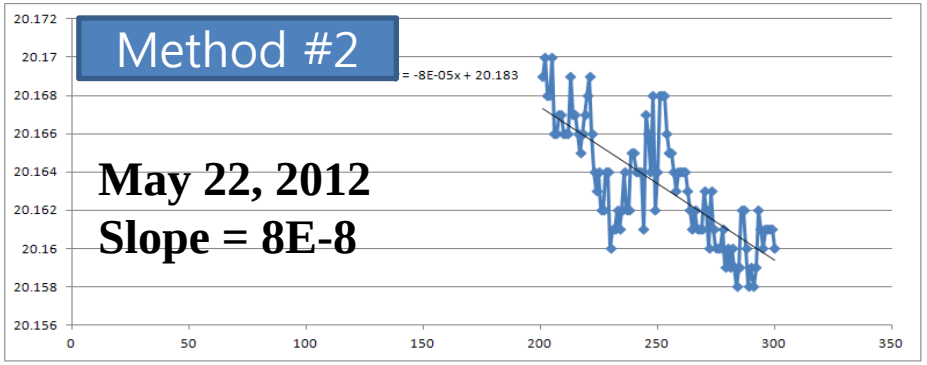


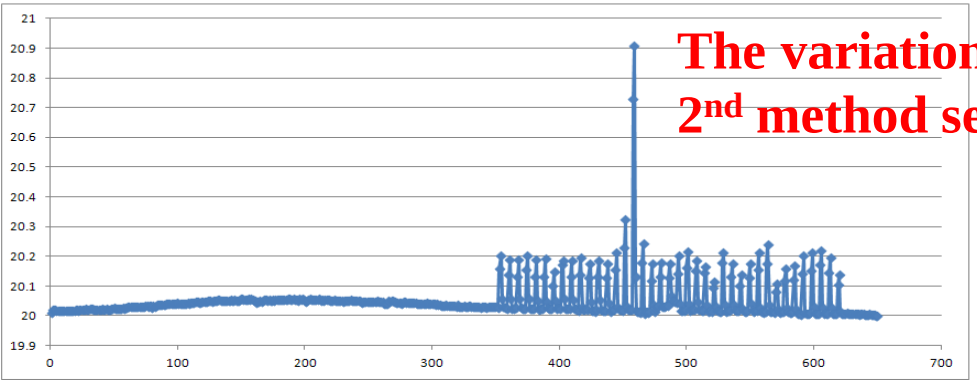




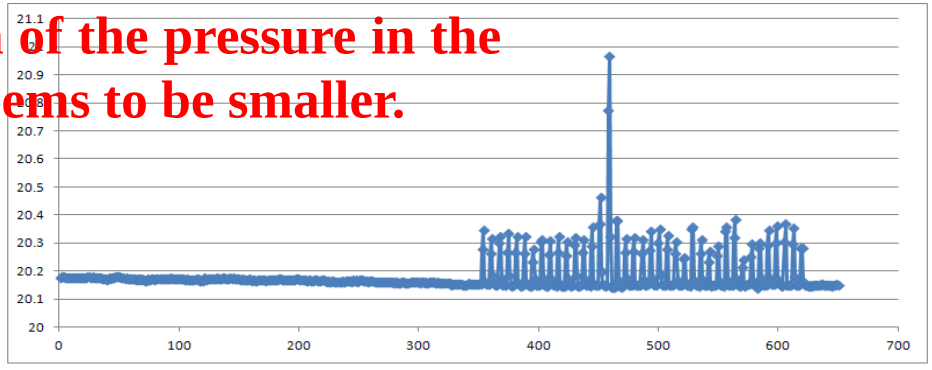








The variation of the pressure in the 2nd method seems to be smaller.



2. Linseed oil test for new washed HPLs

- Manufactured 6 gaps with 12 RE4/2 TW HPLs
- Oil was dried for 90 hours with air (H=50%)
- Pattern of oil layers was as good as the previous production.
- Tested with Chloroform → seems to be well polymerized.

Not-well dried oil layer → chloroform bubbles are quickly dried with fast chemical reaction.

Well dried oil layer → Chloroform bubbles stay on the oil layer and DO NOT quickly dried as if they are dropped on a desk.


2012/05/22 09:42


2012/05/22 09:42


2012/05/22 09:37


2012/05/22 09:48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3. Next steps

Manufactured 10 RE4/2 TW gaps with the rewashed HPLs.
Needs complete procedures for manufacturing normal gaps.
We apply a complete QC tests and upload the data for a further exercise.

- **Test for leak & pop spacers**
- **HV I (HV steps from 0 to 10.0 kV)**
- **HV test II (long term test for 100 hours)**

Rewashing HPL

Sending the HPL box in KODEL to CERN