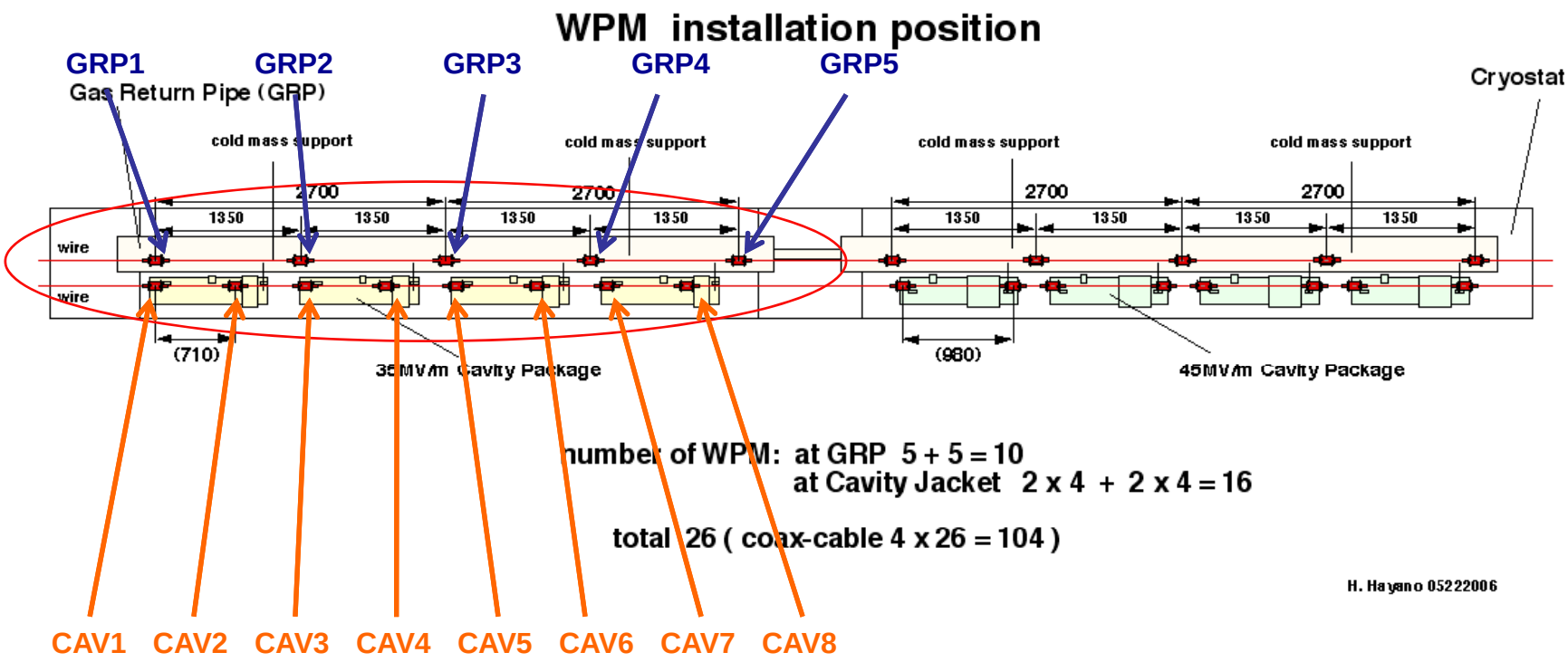
STF
Wire Position Monitor

12.09.2008 H. Hayano

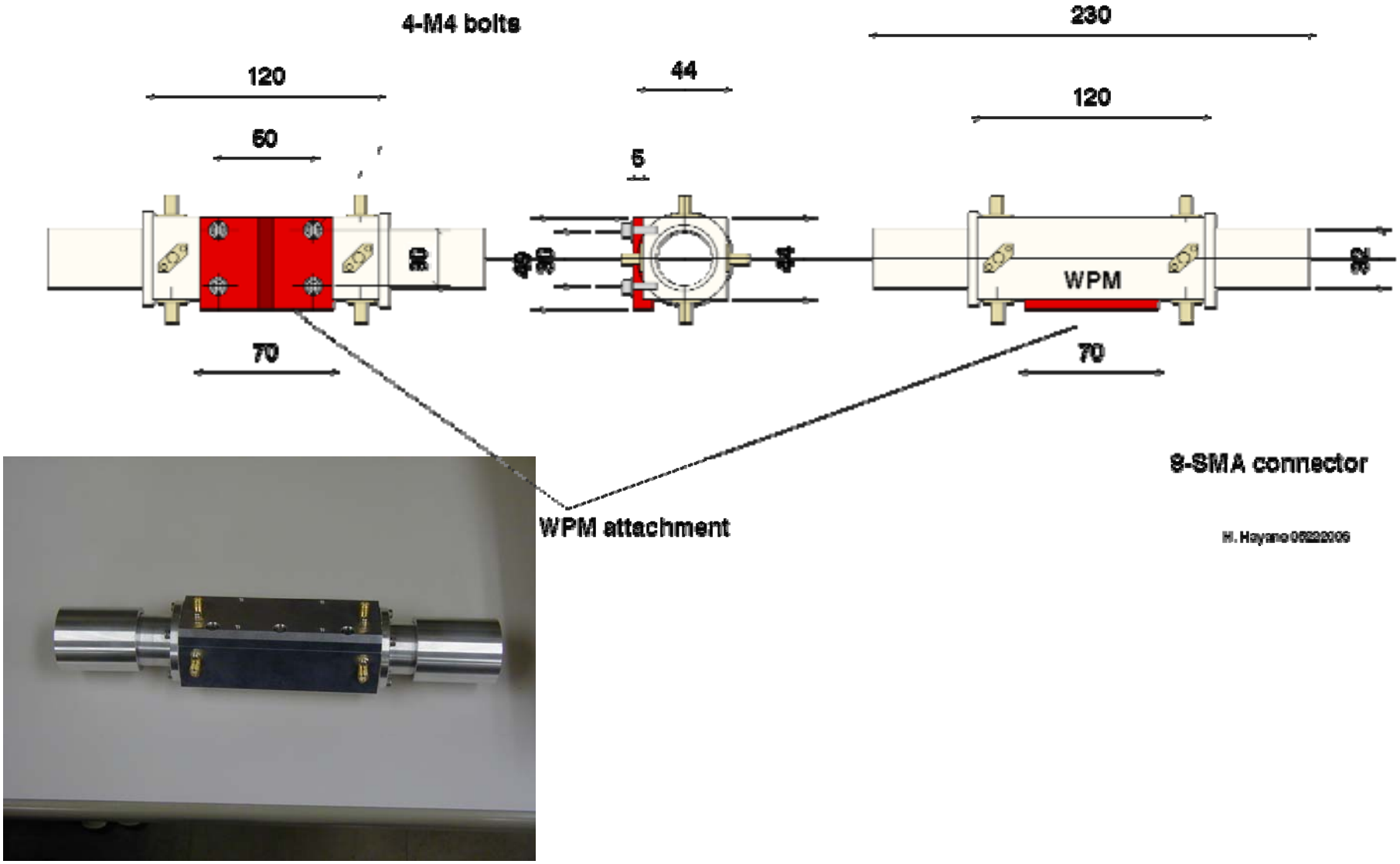
WPM system overall



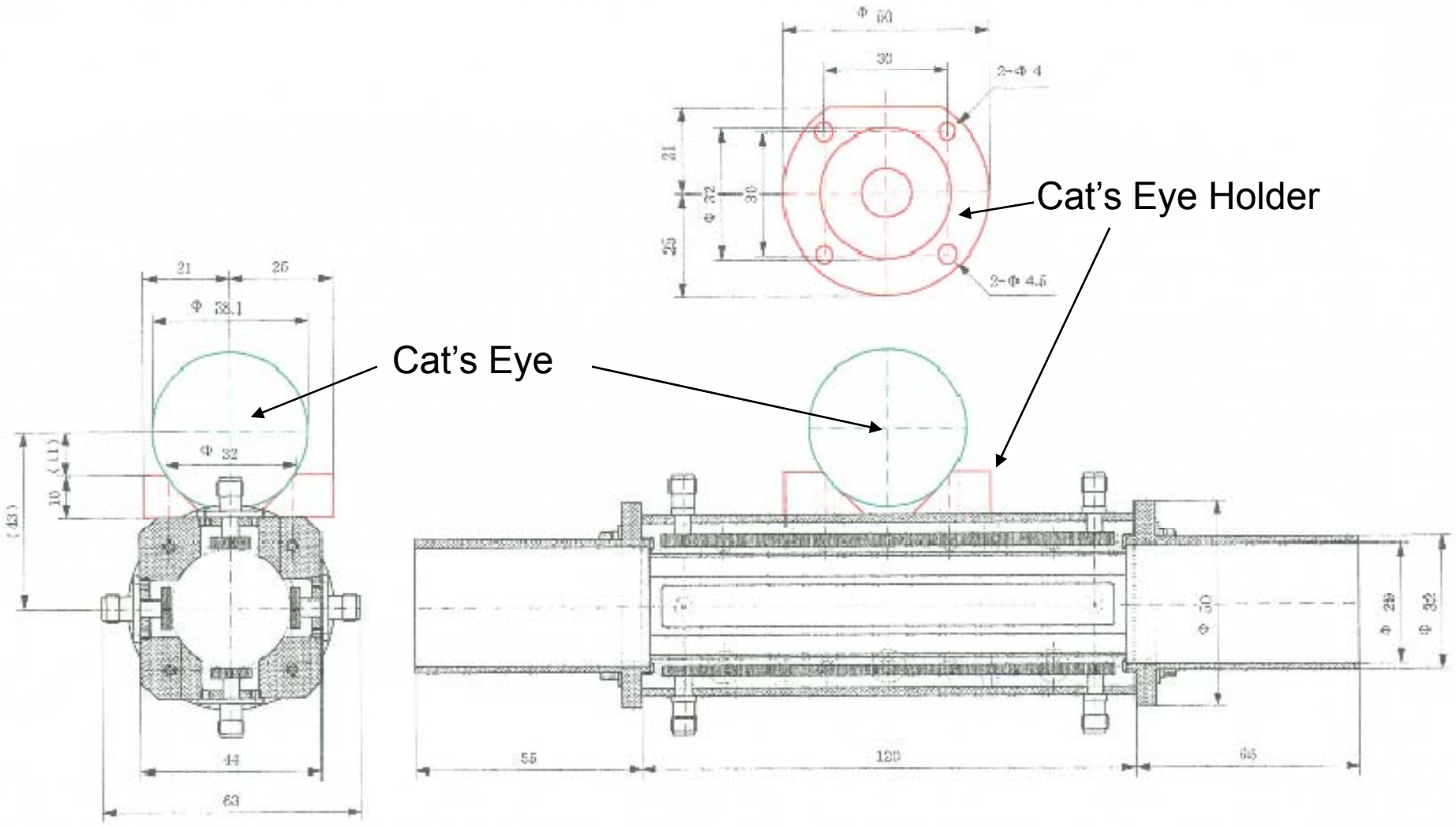
names on the reading software

	Module A		Module A		Module B		Module B
ch1	GRP1	ch9	CAV1	ch17	GRP6	ch25	CAV9
ch2	GRP2	ch10	CAV2	ch18	GRP7	ch26	CAV10
ch3	GRP3	ch11	CAV3	ch19	GRP8	ch27	CAV11
ch4	GRP4	ch12	CAV4	ch20	GRP9	ch28	CAV12
ch5	GRP5	ch13	CAV5	ch21	GRP10	ch29	CAV13
ch6	no connection	ch14	CAV6	ch22	no connection	ch30	CAV14
ch7	no connection	ch15	CAV7	ch23	no connection	ch31	CAV15
ch8	no connection	ch16	CAV8	ch24	no connection	ch32	CAV16

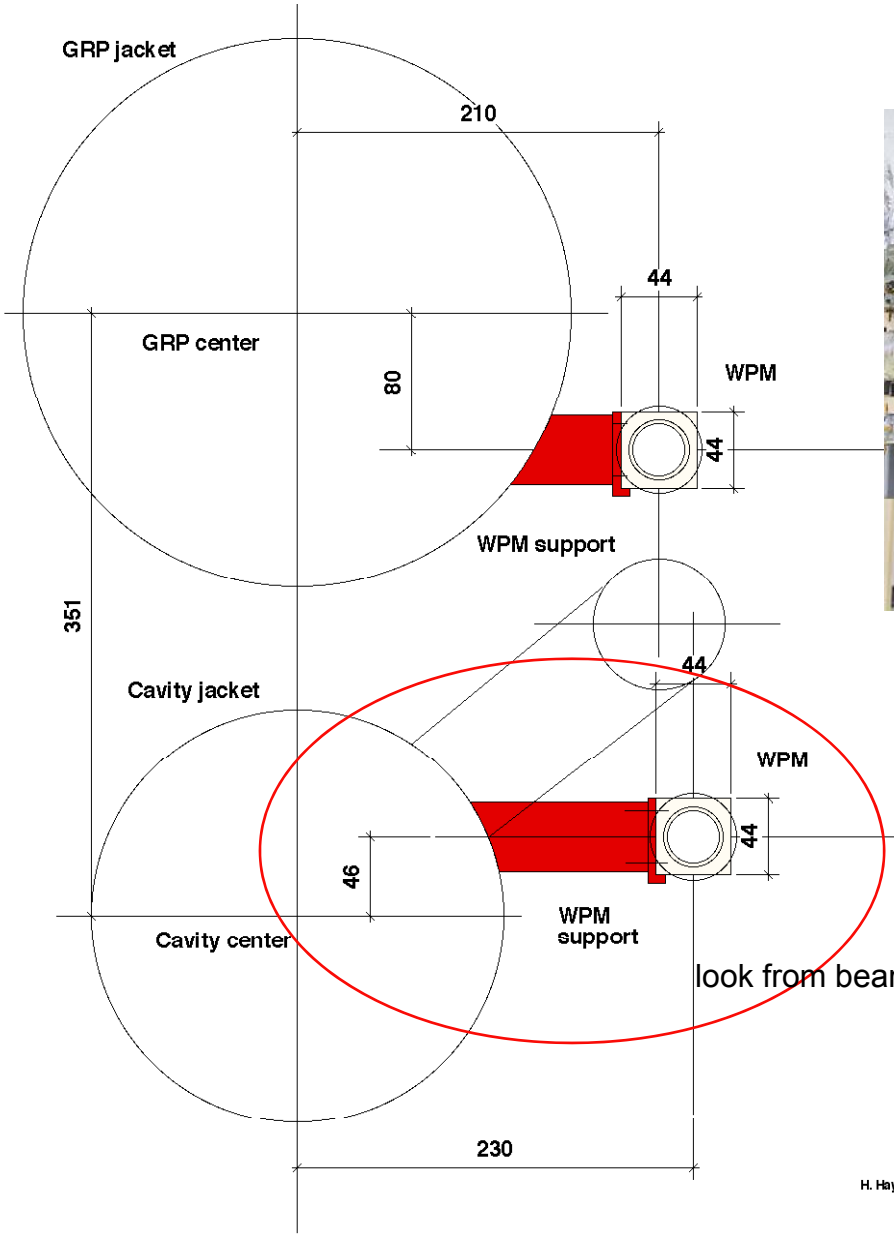
WPM attachment on the holder plate



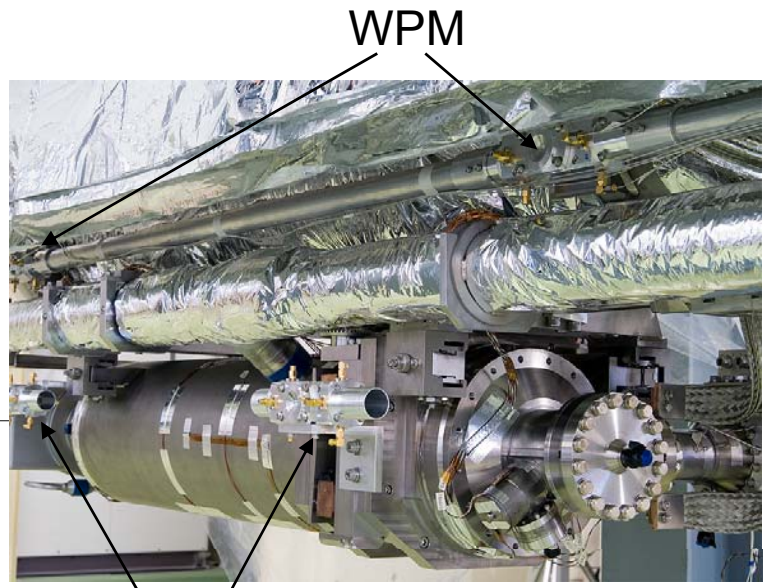
WPM detector body



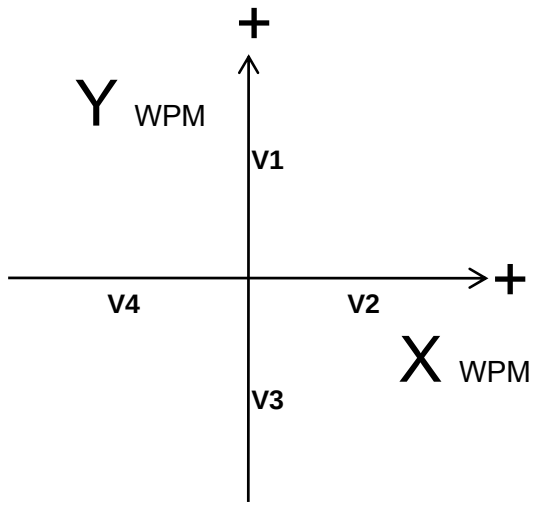
WPM mount and coordinate system



look from beam upstream

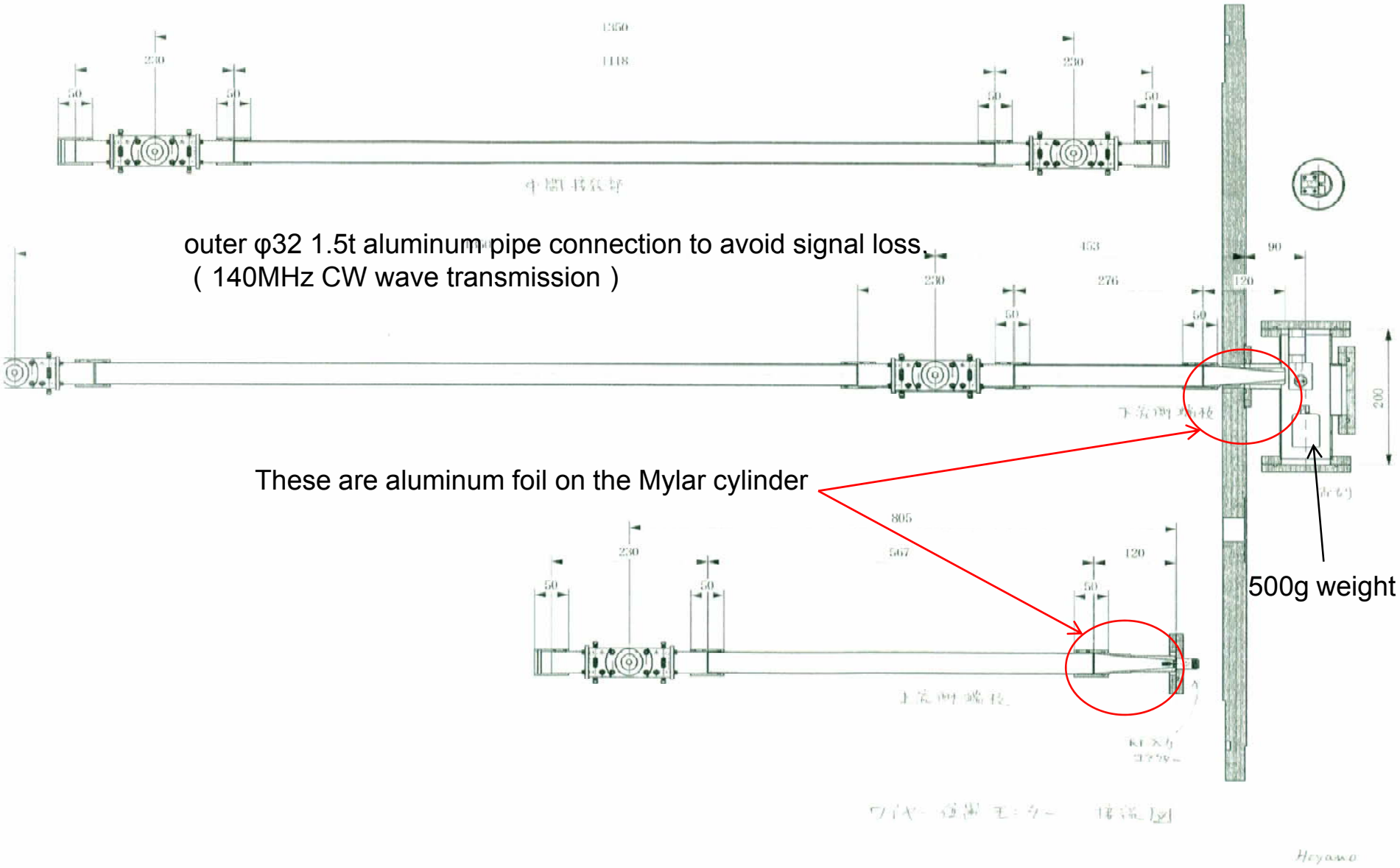


example of TESLA shape cavity

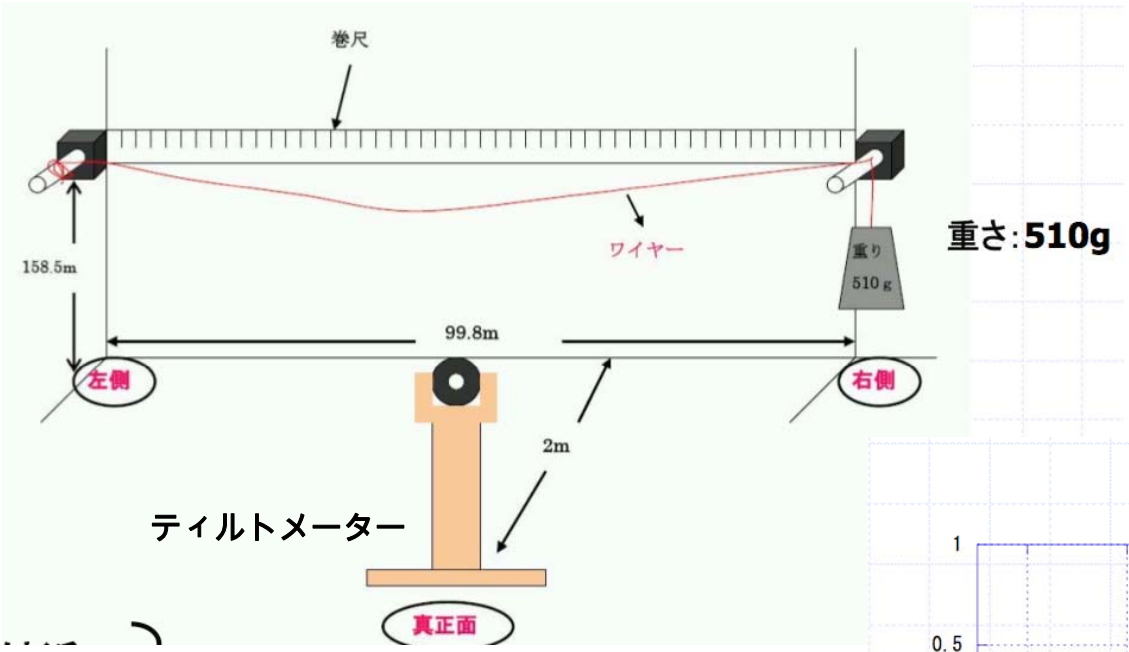


look from beam upstream

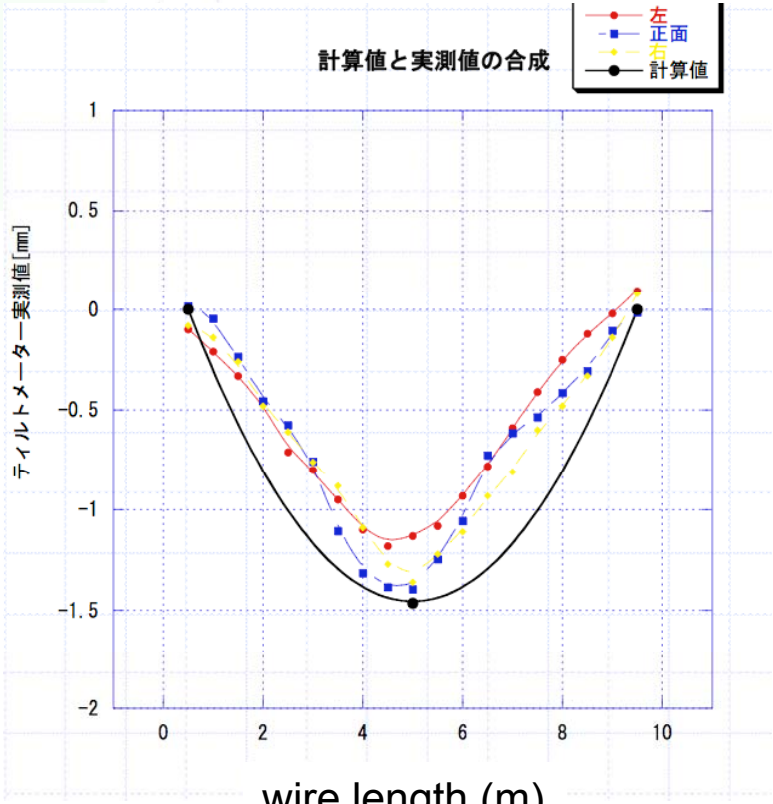
connection between WPM, and both end of wire



7μm diameter Tungsten Wire stretch for 10m



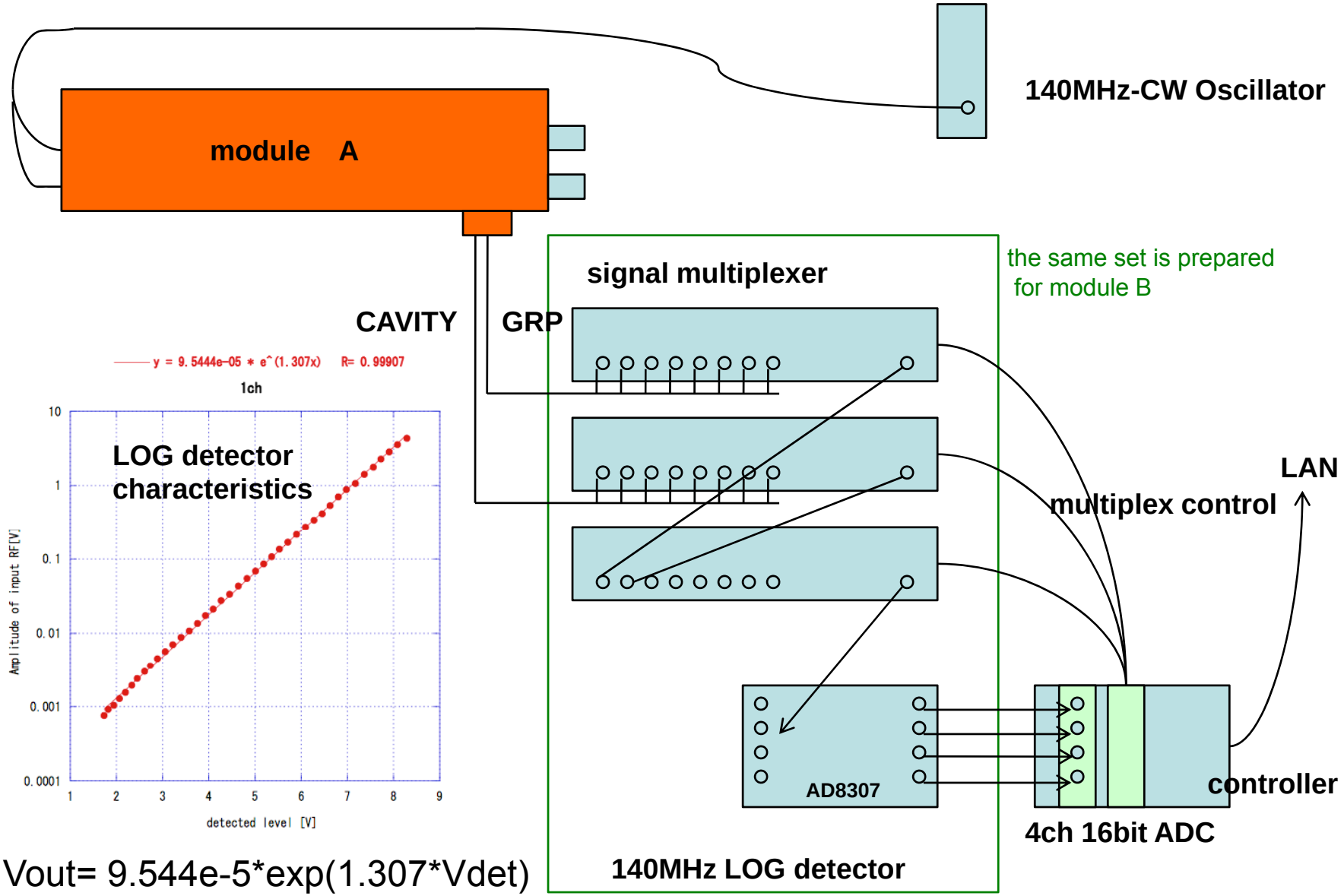
重さ:510g



sag was 1.4mm
（ estimation was 1.475mm ）

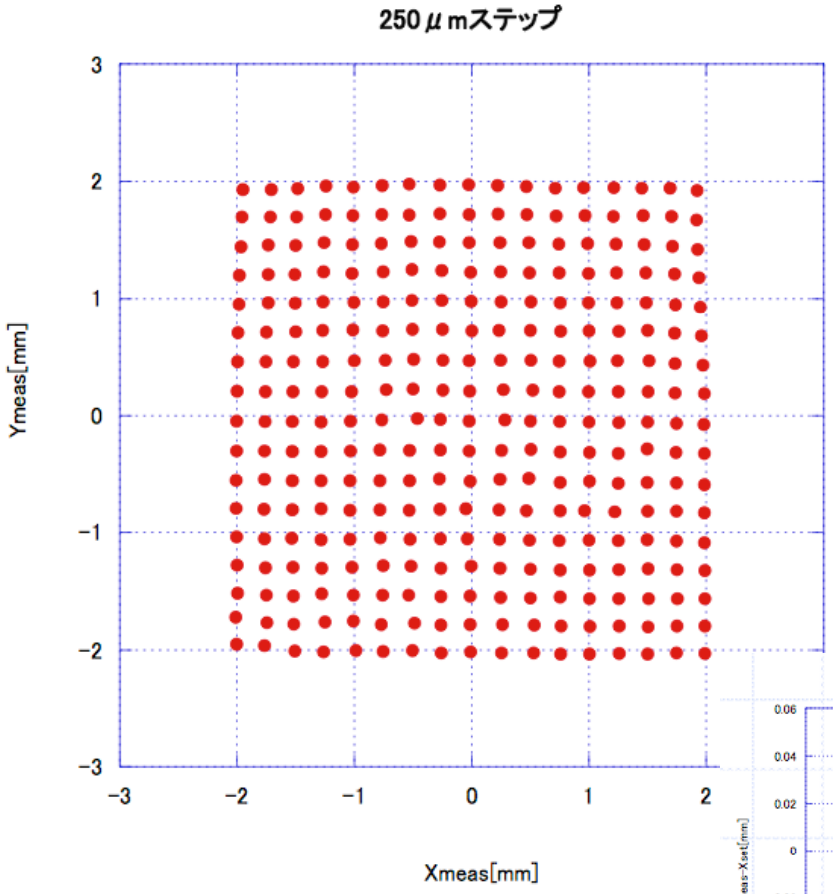
* 36m module →19.1mm sag

Detector circuit



Vout= 9.544e-5*exp(1.307*Vdet)

+/- 2mm mapping example



formula :

$X = kx * (V2-V4)/(V2+V4)$

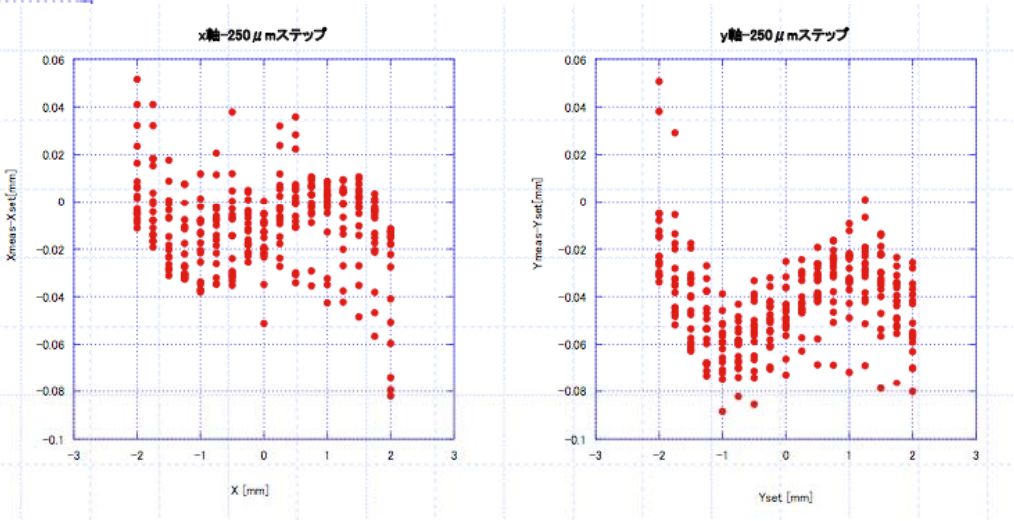
$Y = ky * (V1-V3)/(V1+V3)$

linear approximation

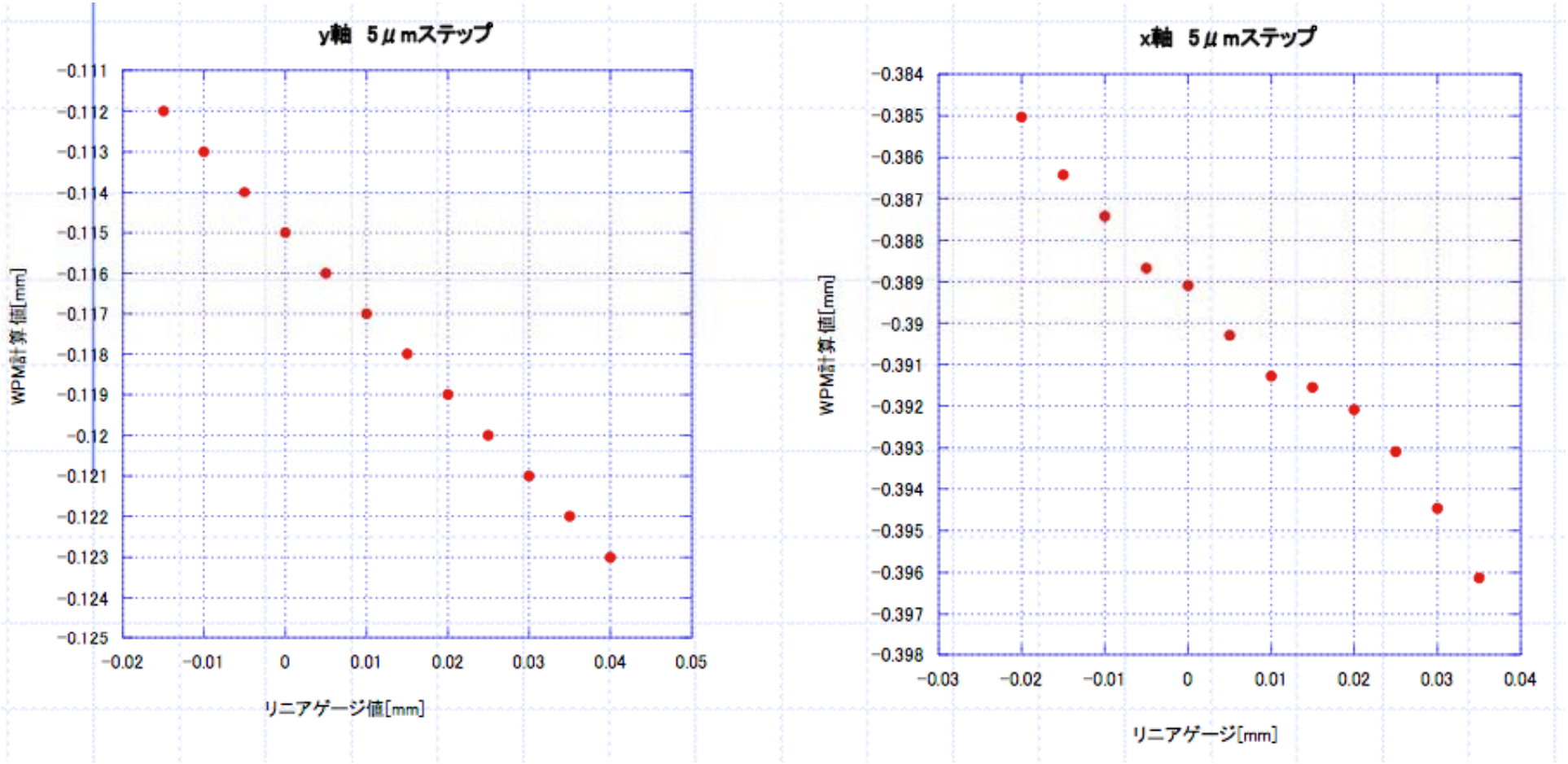
Kx=Ky=7.262 mm

difference from wire position set value

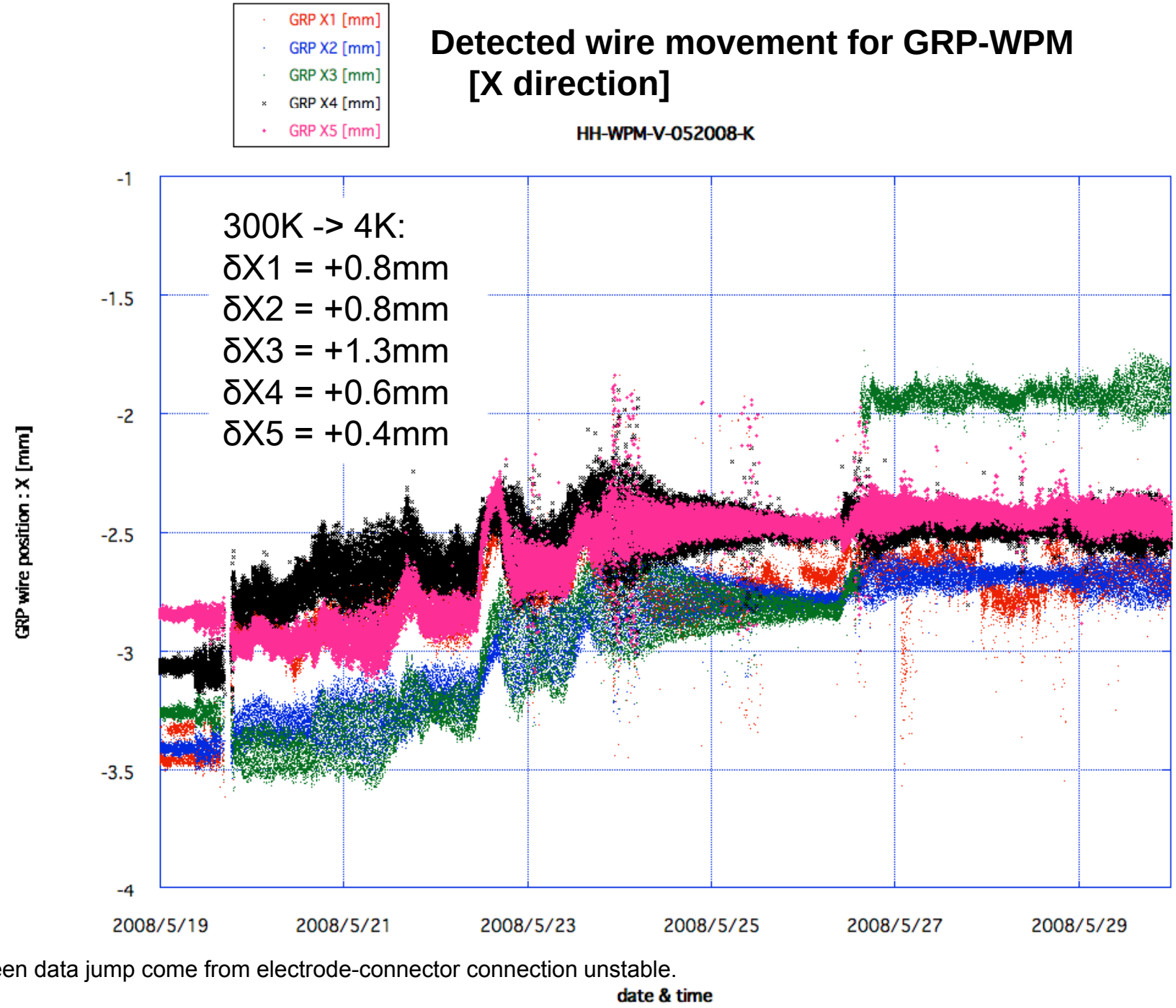
full width140μm error



Resolution in case 5μm step wire movement

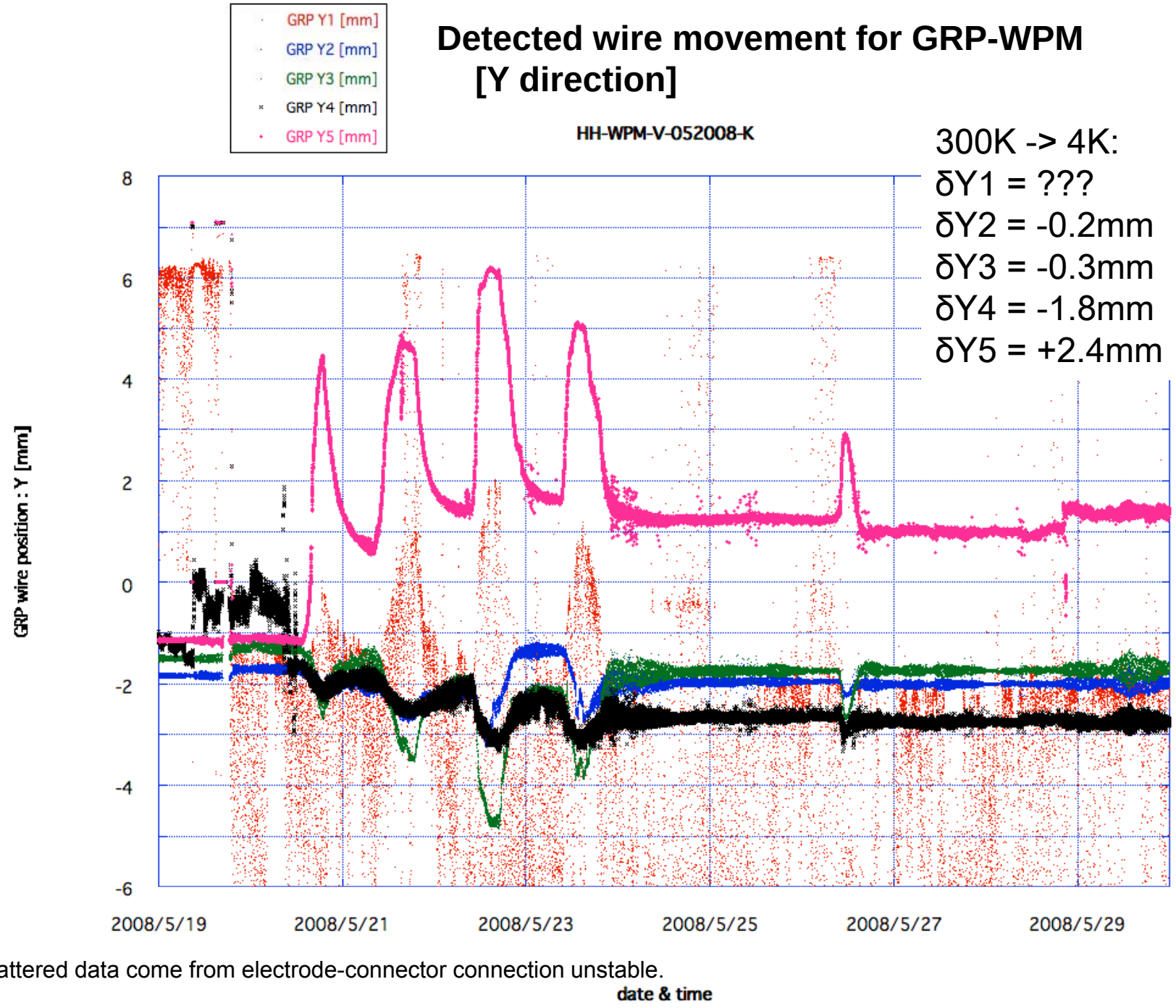


estimated resolution will be less than 5micron

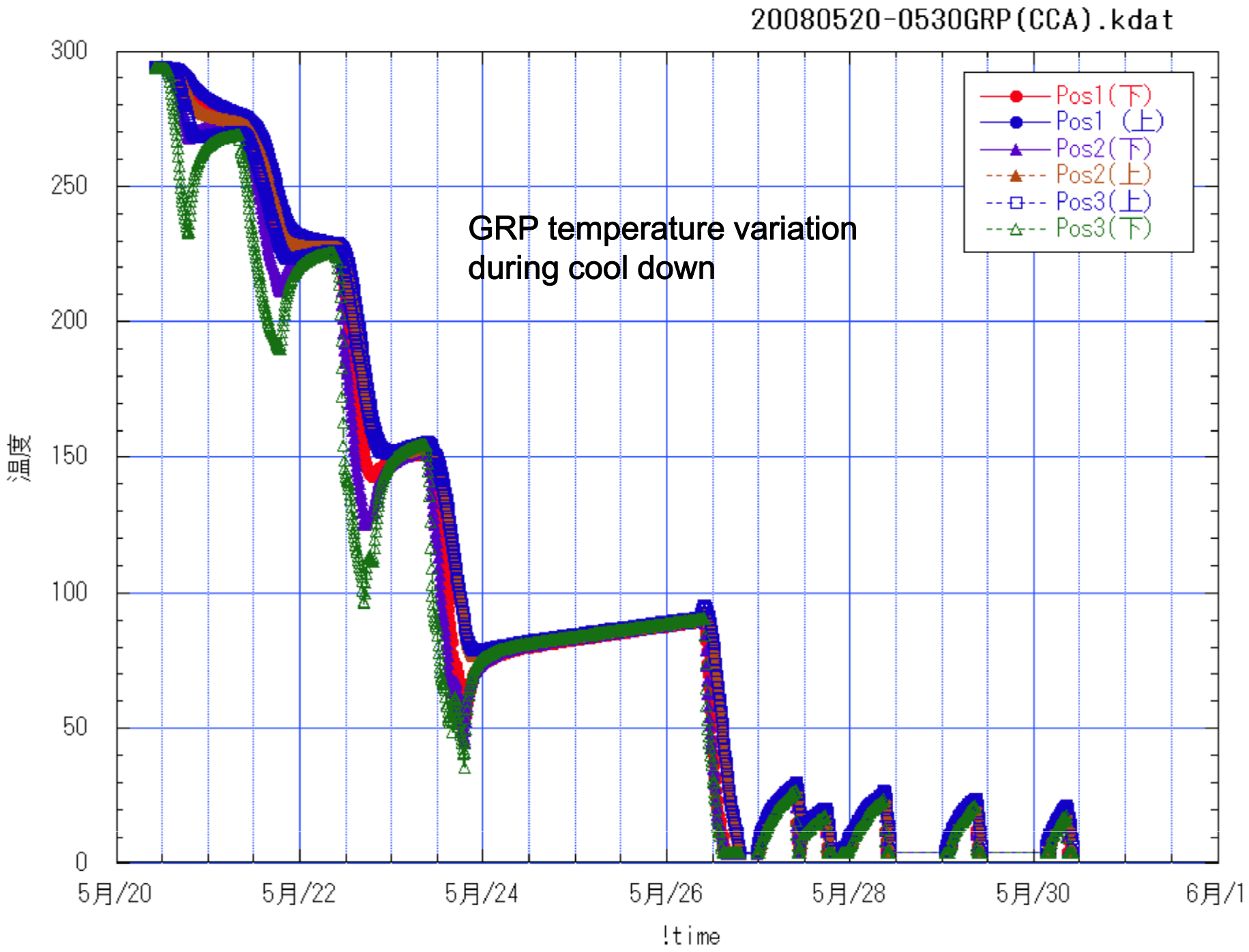


green data jump come from electrode-connector connection unstable.

Detected wire movement for GRP-WPM [Y direction]

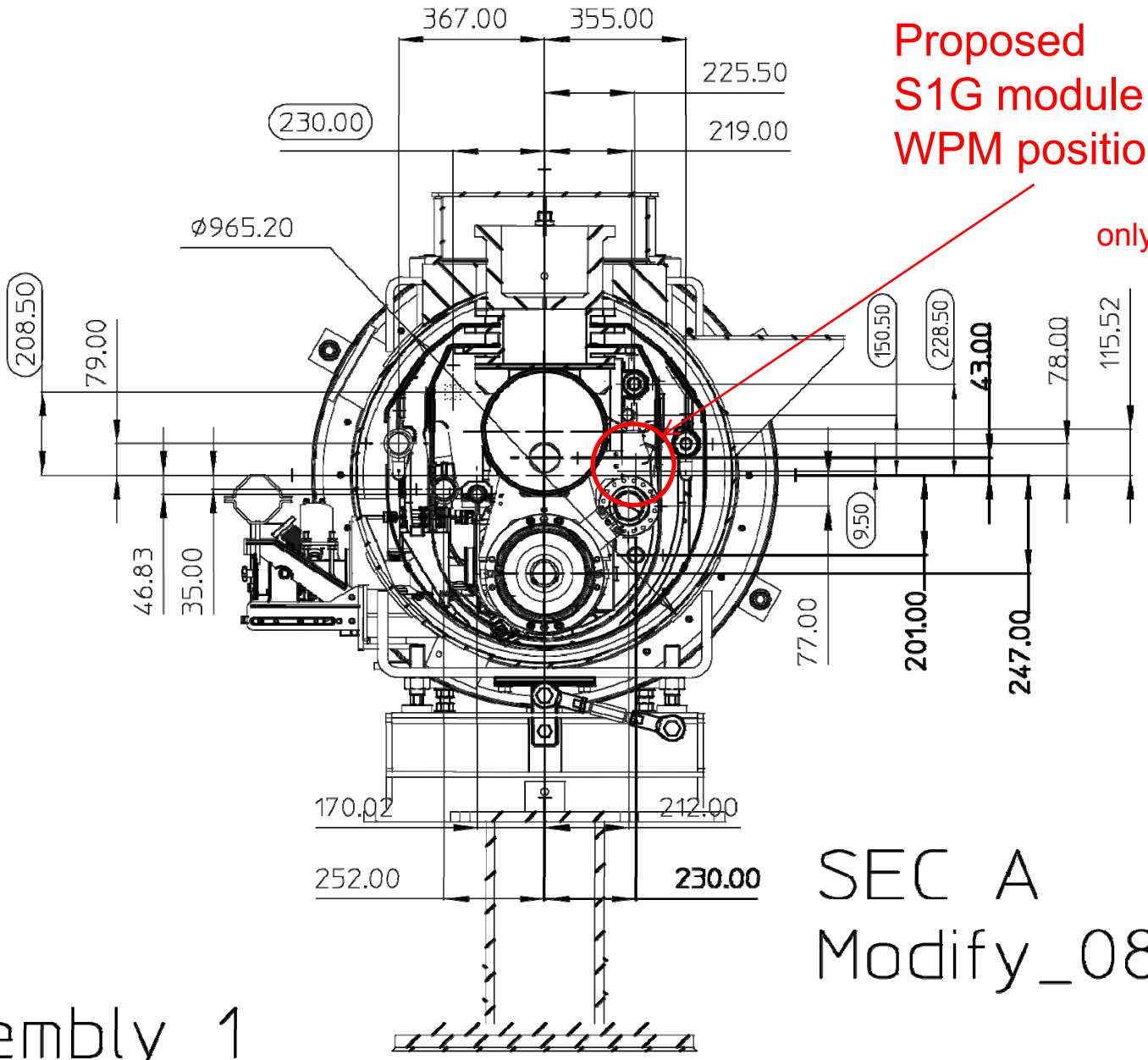


scattered data come from electrode-connector connection unstable.


20080520-0530GRP(CCA).kdat
GRP temperature variation
during cool down
Pos1(下)
Pos1 (上)
Pos2(下)
Pos2(上)
Pos3(上)
Pos3(下)
温度
300
250
200
150
100
50
0
5月/20
5月/22
5月/24
5月/26
5月/28
5月/30
6月/1
!time

Upgrade of WPM

(1) Electrode – connector connection change
from solder to spot welding (next month).
(2) signal cable change to more strong one (next month).
(3) SMA feed-through will be checked for the connection
(next month).
(4) WPM will be calibrated by optical telescope method
in April 2008 cool down test.
(5) study to use more narrow-band detection
to resolve noisy (scattered) detected position.
(in future, maybe in S1G)



S1_Assembly_1

Date : 081111 Rev.8