

Alignment of SLAC Magnets

December 14th, 2009

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Performed in September 14 – 16, 2009

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SLAC magnets: SF6FF, SF5FF, SD4FF in the beam line
SF1FF, QF1FF, SD0FF, QD0FF in the FD system

Alignment reference system for these magnets is very different from that for KEK magnets

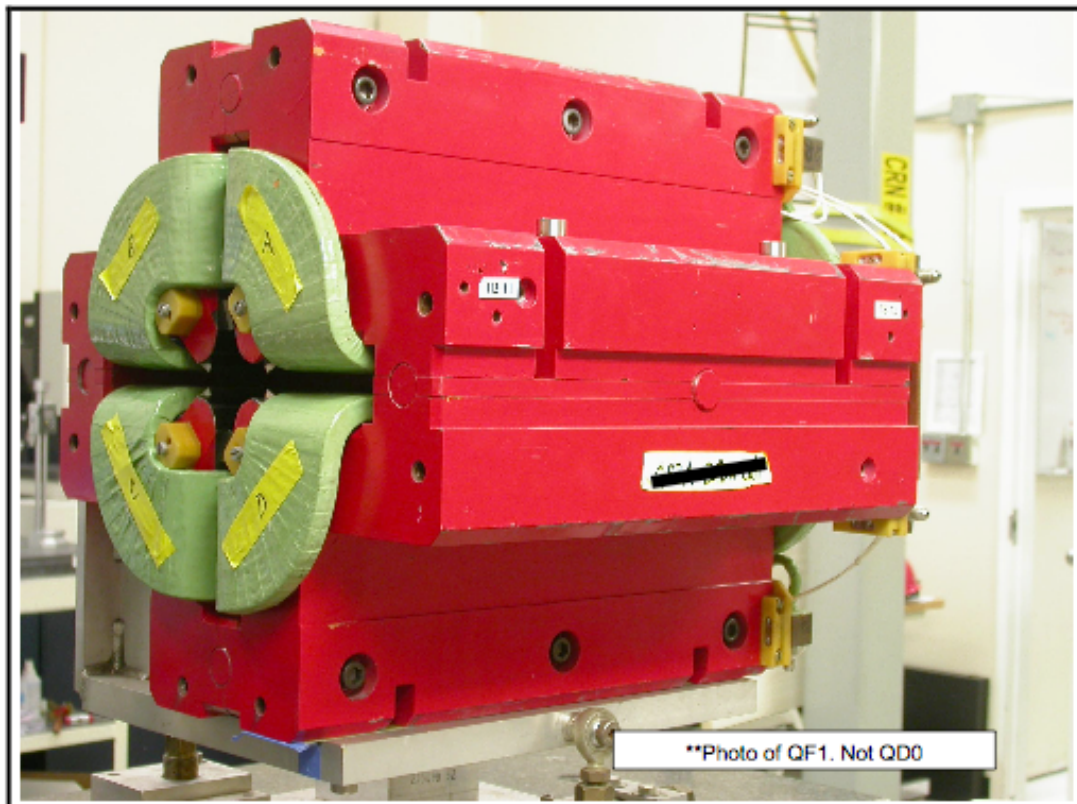
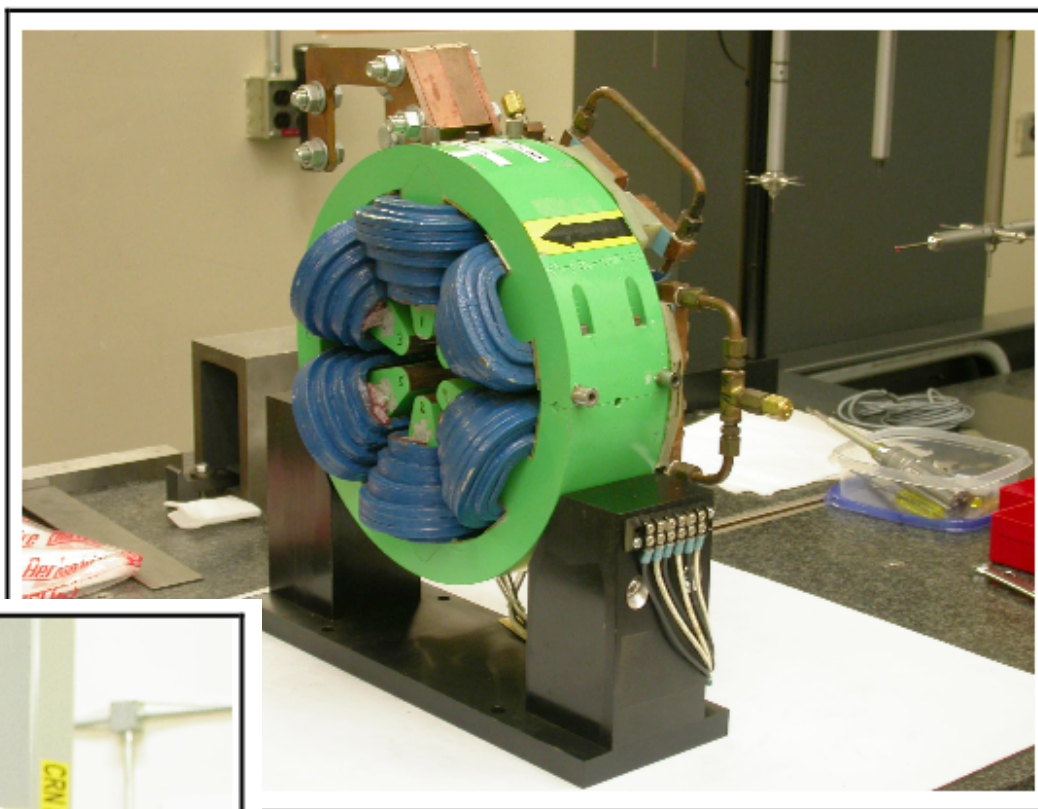
- Positions for SLAC magnets were surveyed with the laser tracker in July 2009
- Alignment errors for these SLAC magnets were found to be rather big (order of mm)
- I had decided to do the re-alignment for these magnets utilizing the SLAC alignment reference system



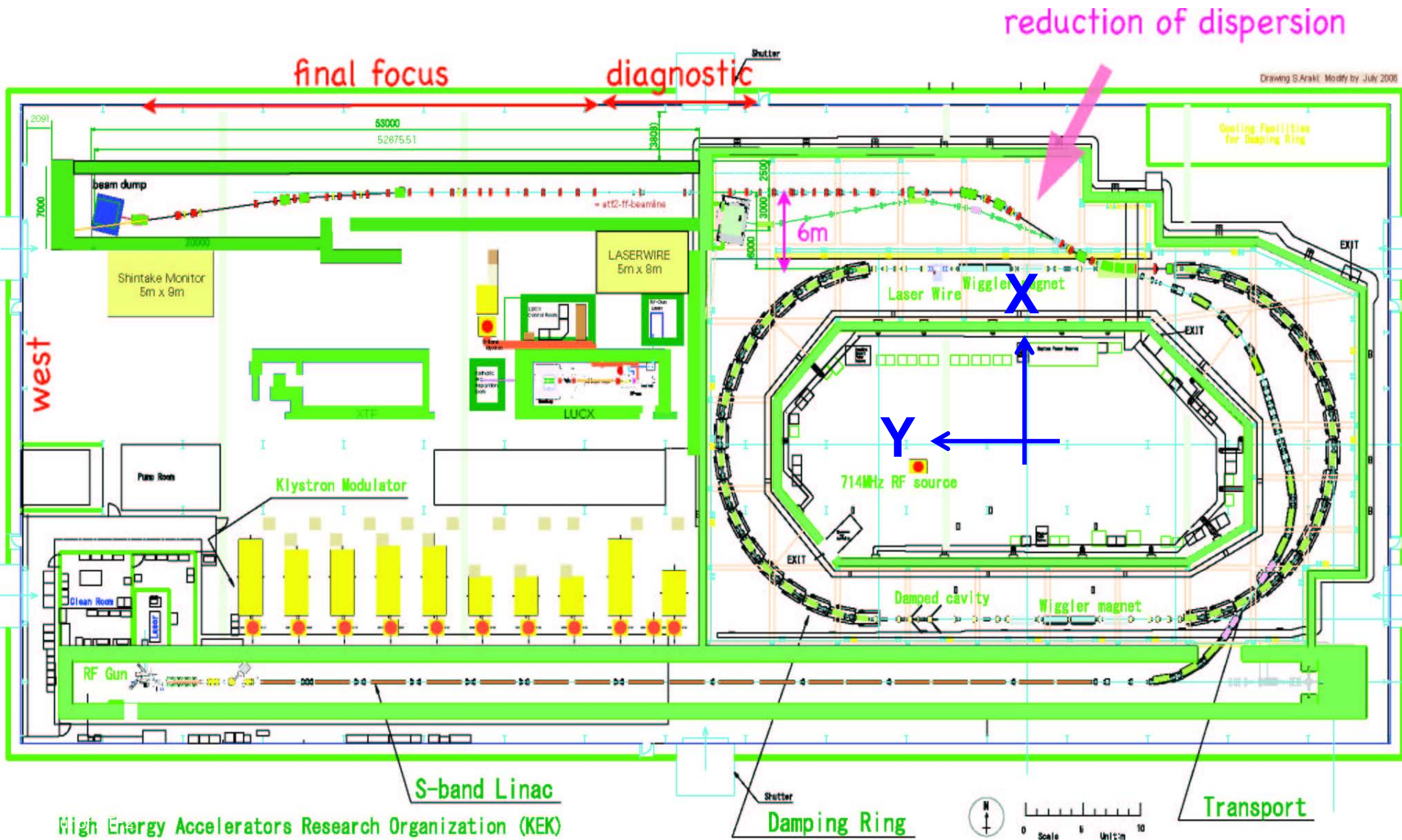
The 9th A1

SF6, SD4

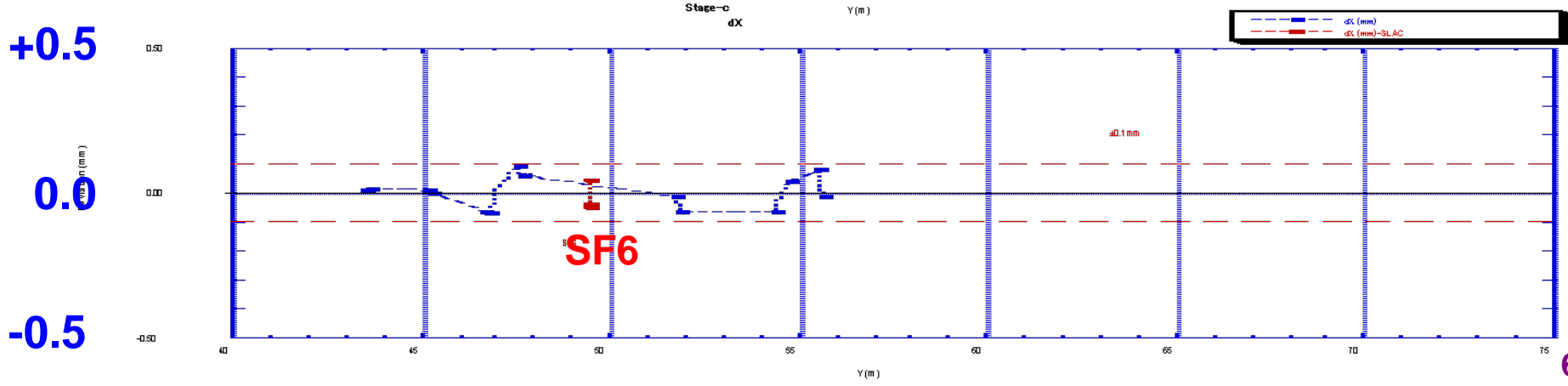
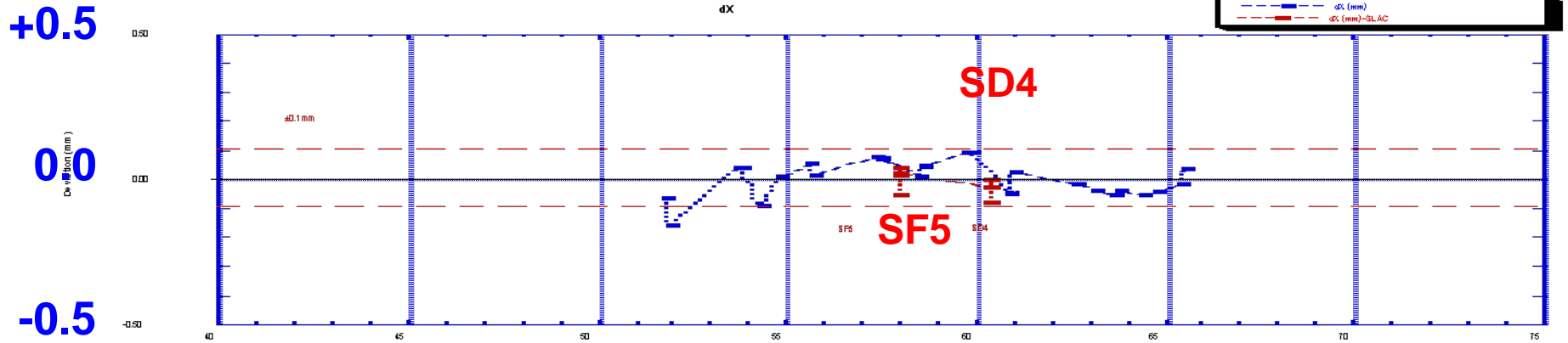
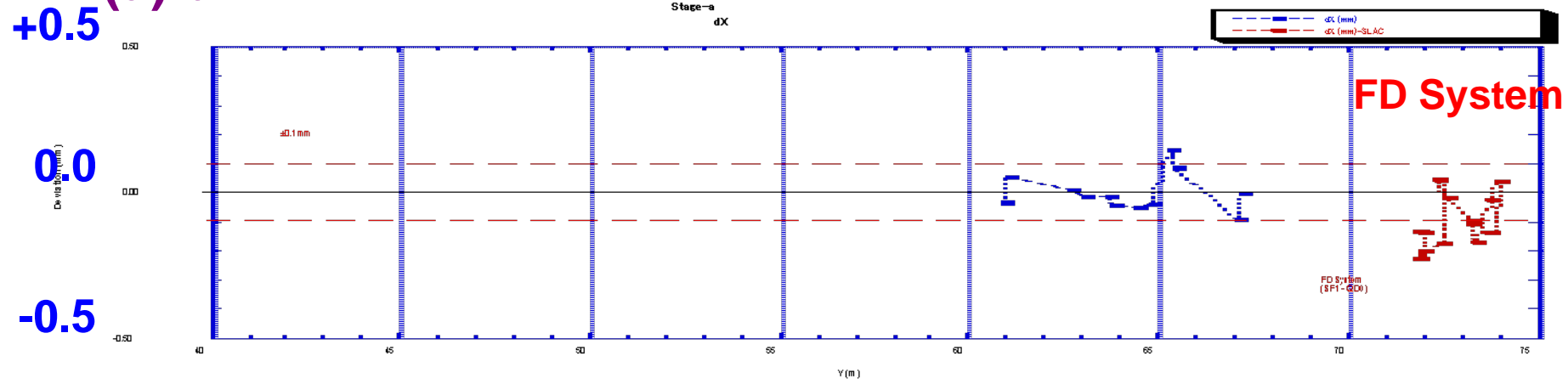
QF1, QD0



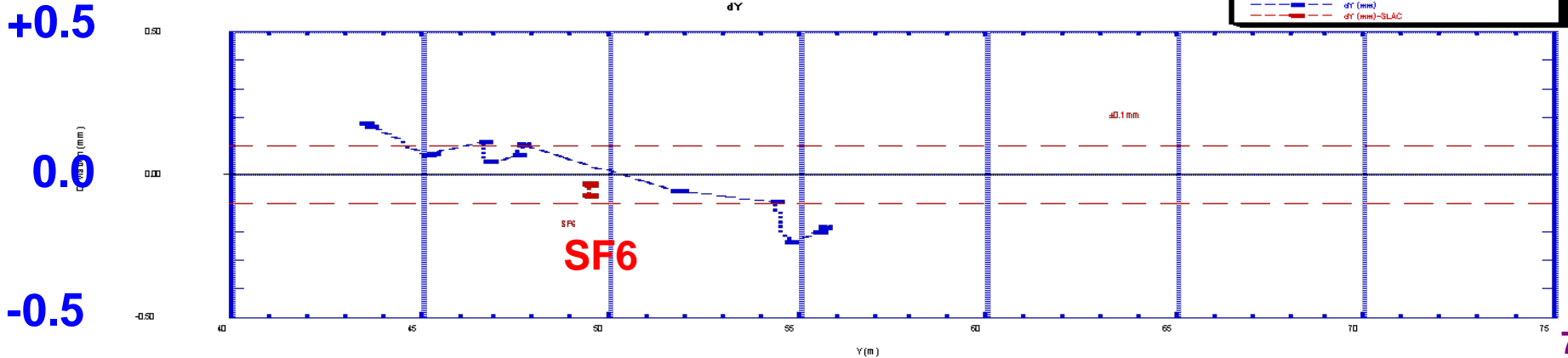
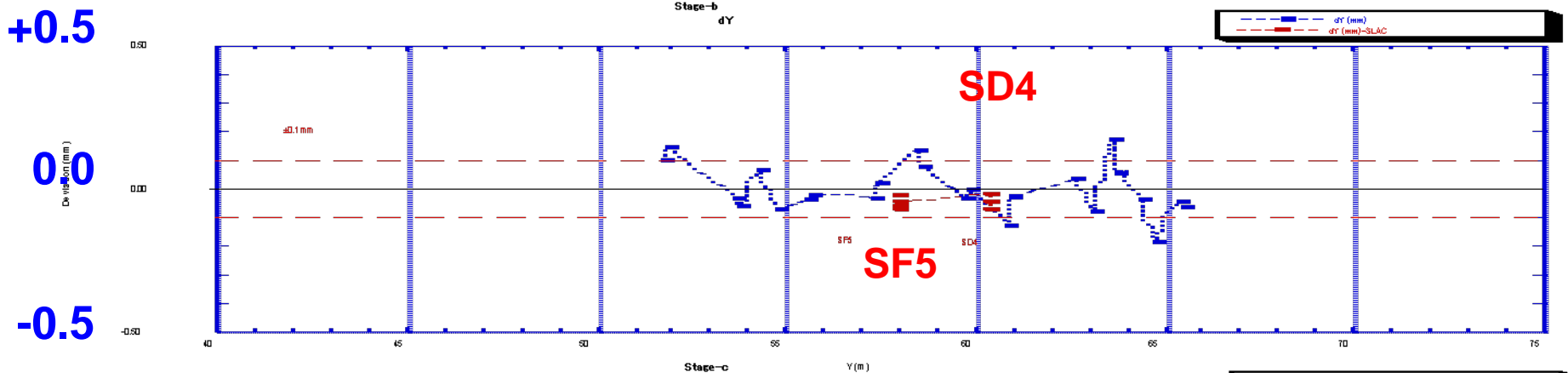
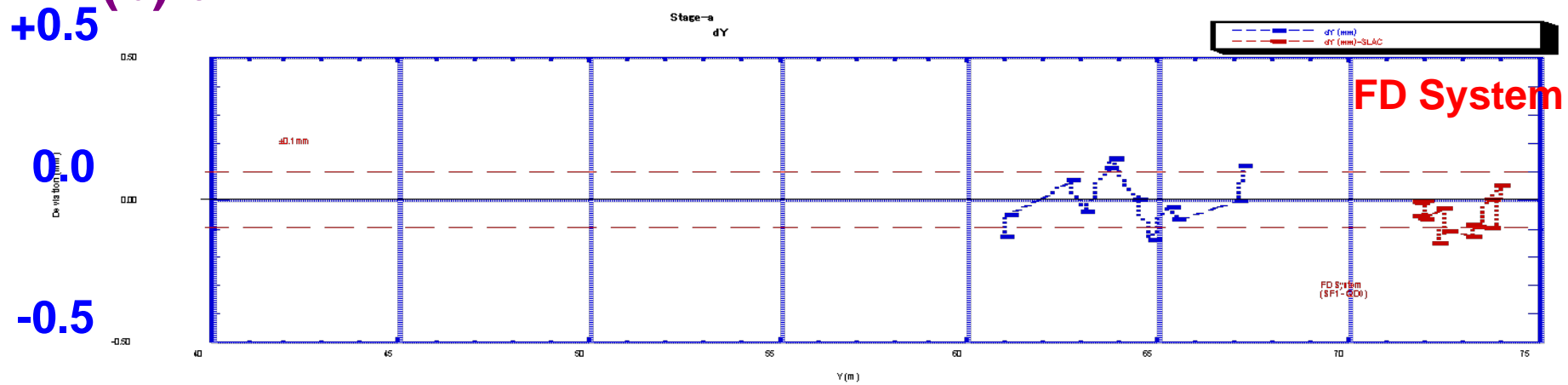
ATF-ring and ATF2 Beam Line Definition of the coordinate



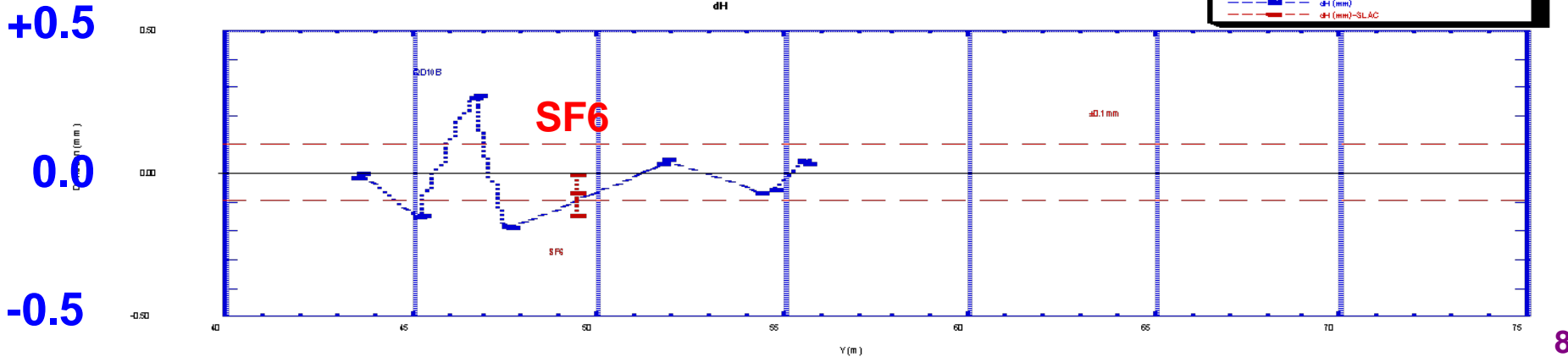
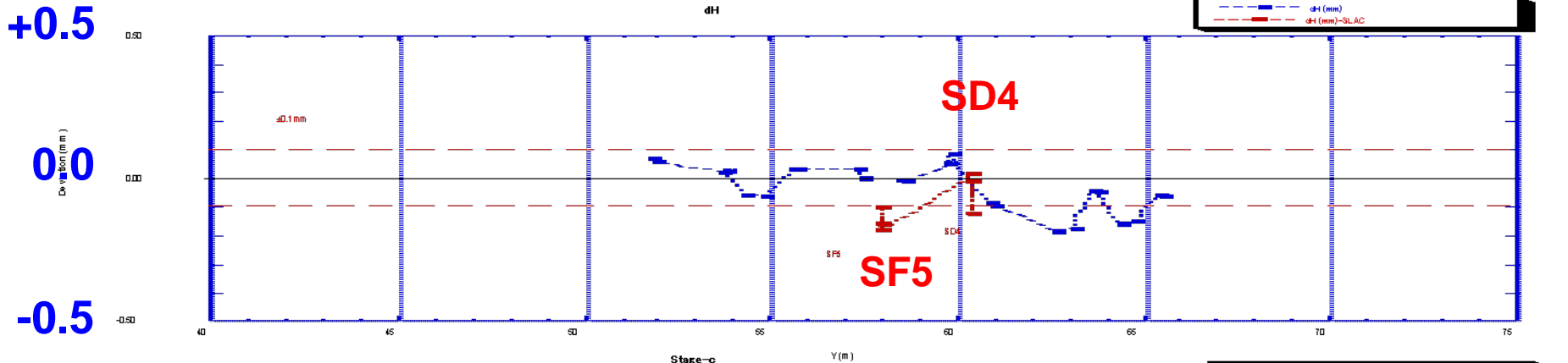
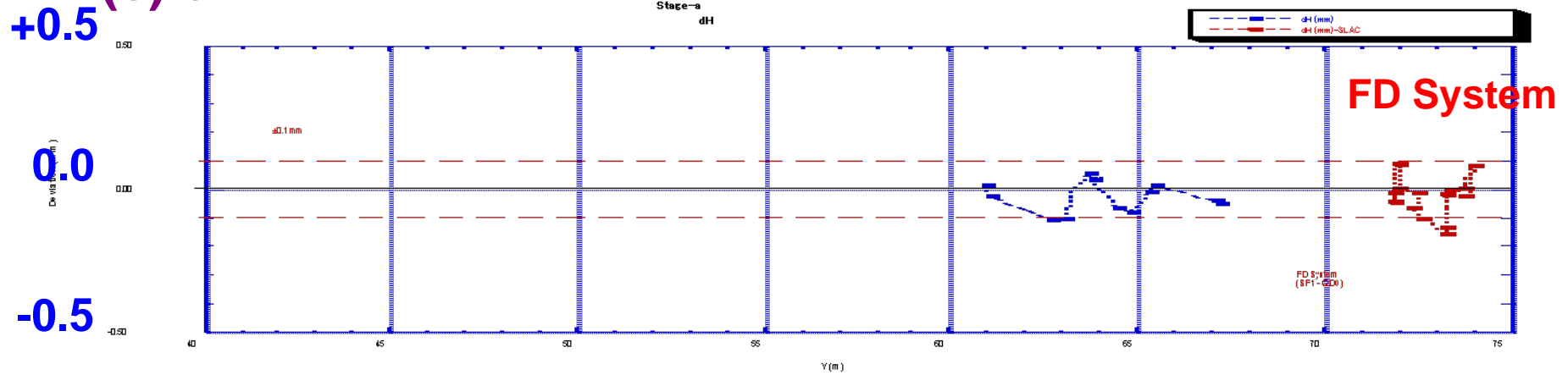
(a) dX



(b) dY



(c) dH



Alignment Note

In the survey in July, Shintake Monitor was found to be placed 2.849mm downstream

→Talking to Kuroda and Okugi, we have decided to place the FD system 2.849mm downstream to keep the designed distance to the Shitake Monitor

QF1FF

To adjust the height difference of 0.35mm between left and right side, the magnet was rolled with the mover by

Tilt: +1.4 mrad

QD0FF

To adjust the height difference of 0.2mm between left and right side, the magnet was rolled with the mover by

Tilt: +0.7 mrad

Y: +100 μ m

Comment

- Errors for roll angles expected from the one point alignment errors of 0.1mm

<u>Magnet</u>	<u>Span</u>	<u>Expected error</u>
SF6	194 mm	0.72 mrad
SF5	123	1.13
SD4	210	0.67
SF1, SD0	184	0.76
QF1, QD0	421	0.33

--> Spans between the reference points are too short to do the precision alignment for roll angles



Alignment Errors of FD-magnets

(a) dX

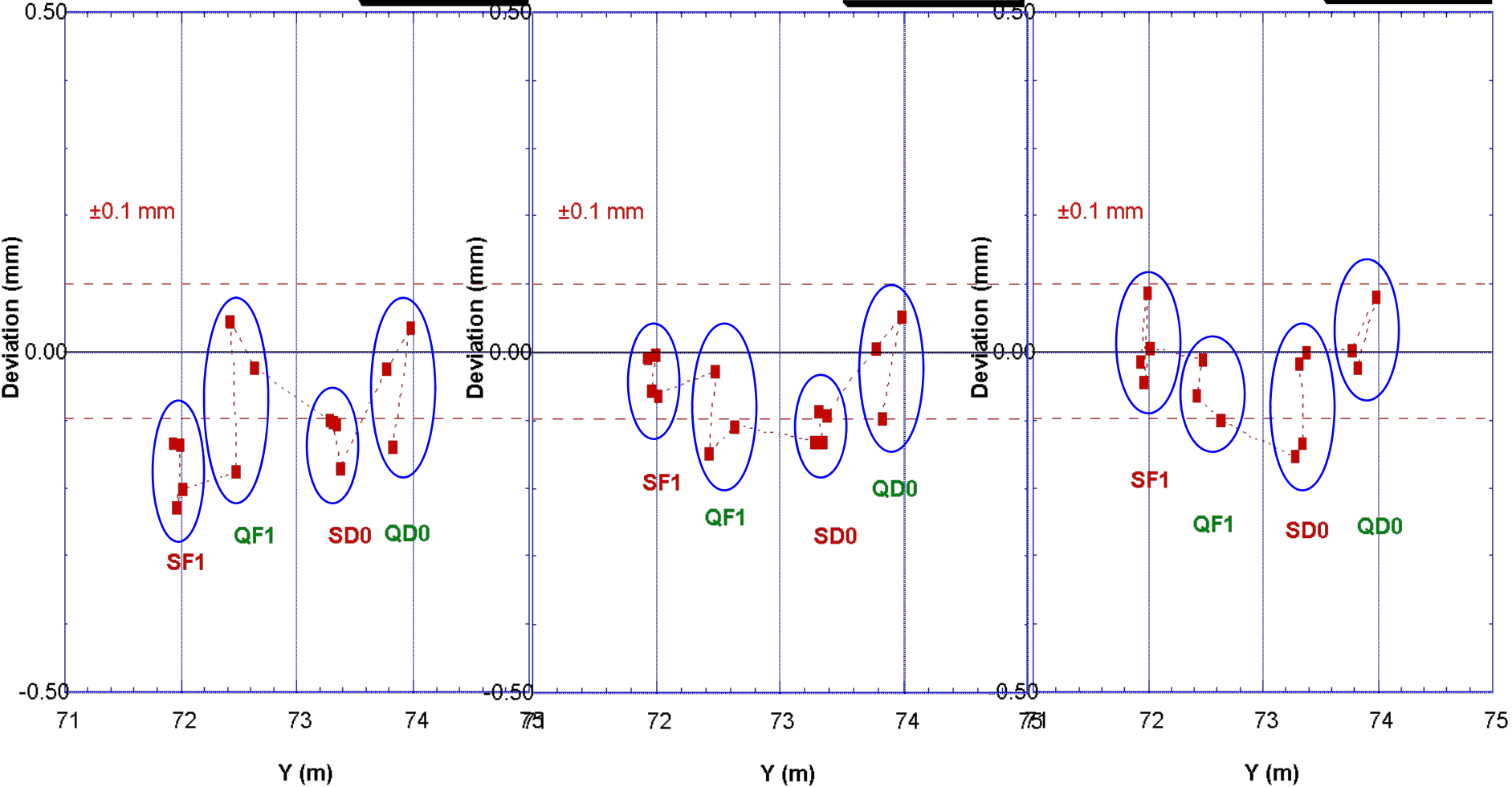
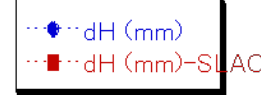
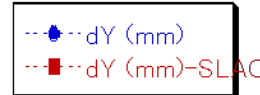
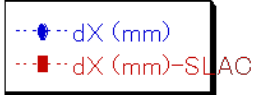
(b) dY

(c) dH

Stage-a
dX

Stage-a
dY

Stage-a
dH

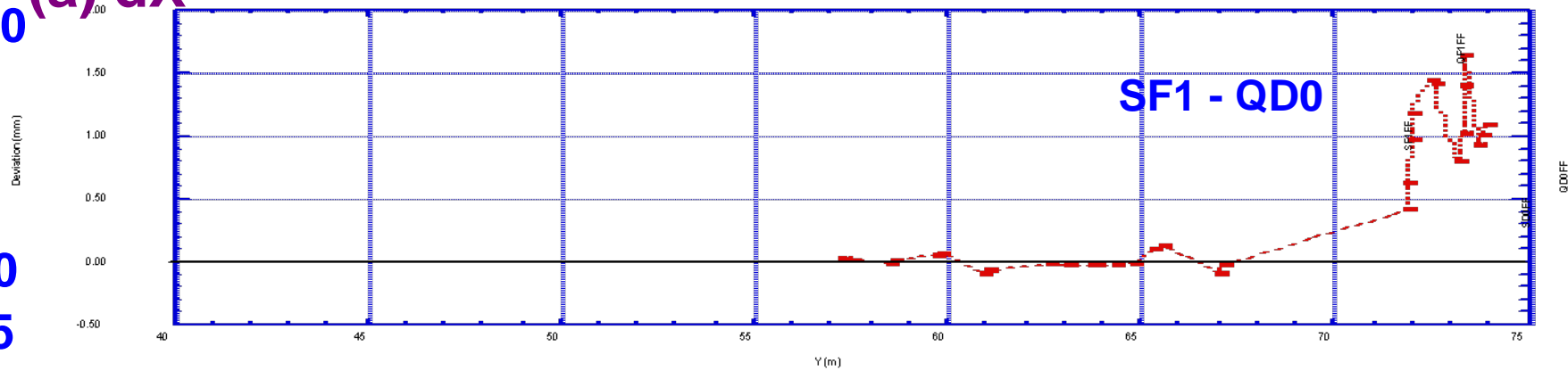


(a) dX

+2.0

0.0

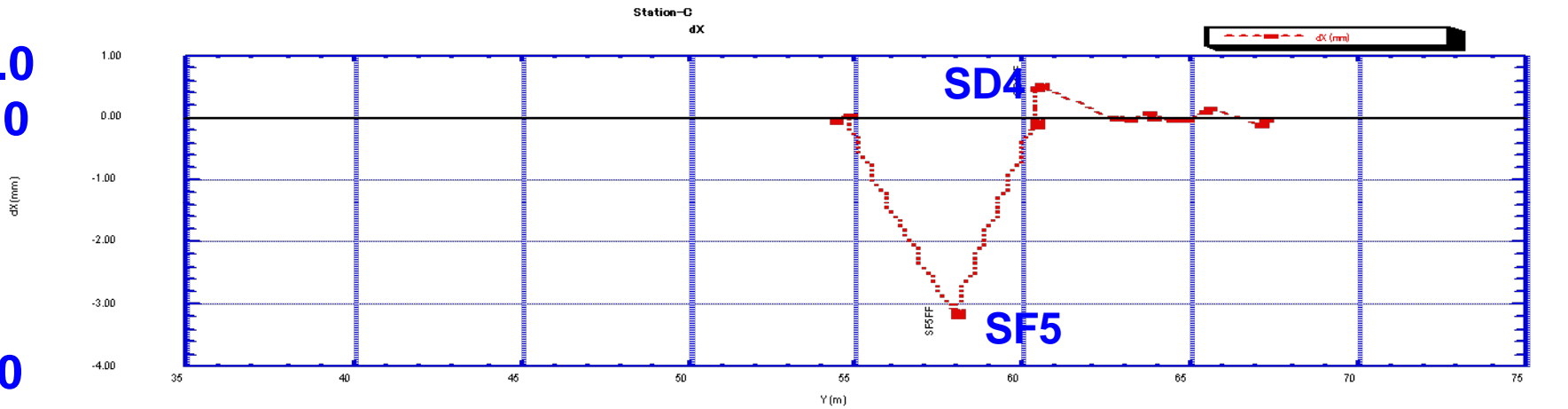
-0.5



+1.0

0.0

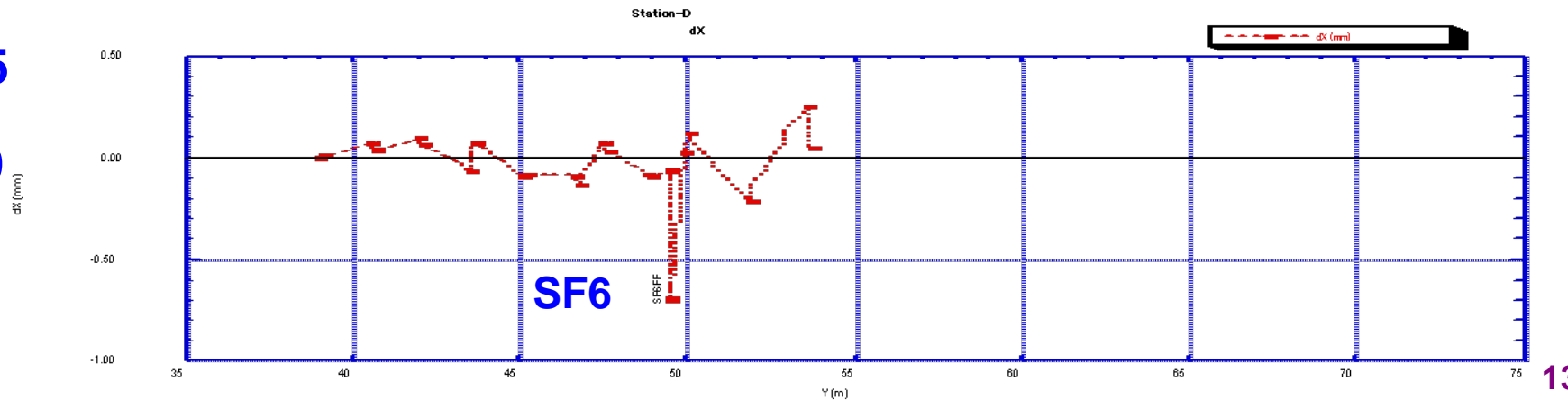
-4.0



+0.5

0.0

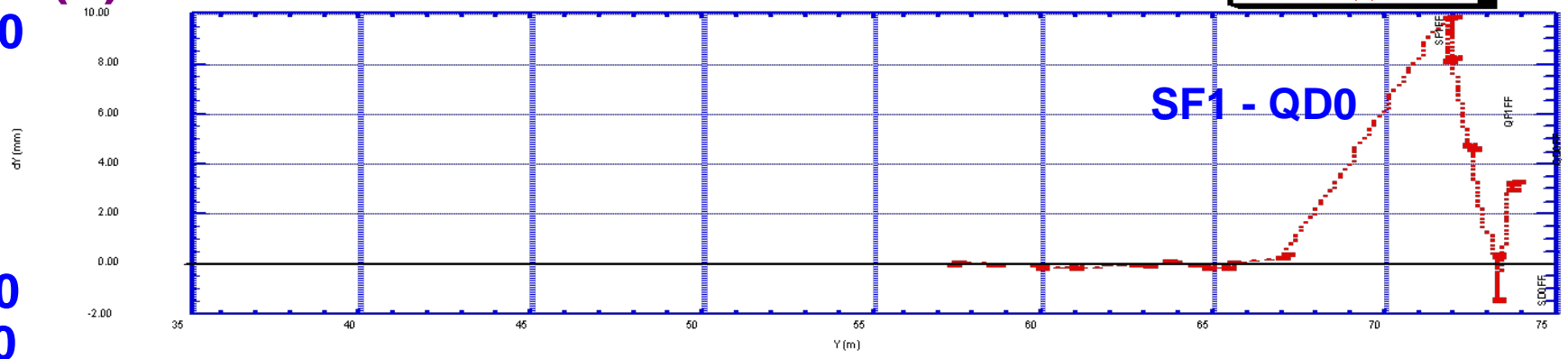
-1.0



(b) dY

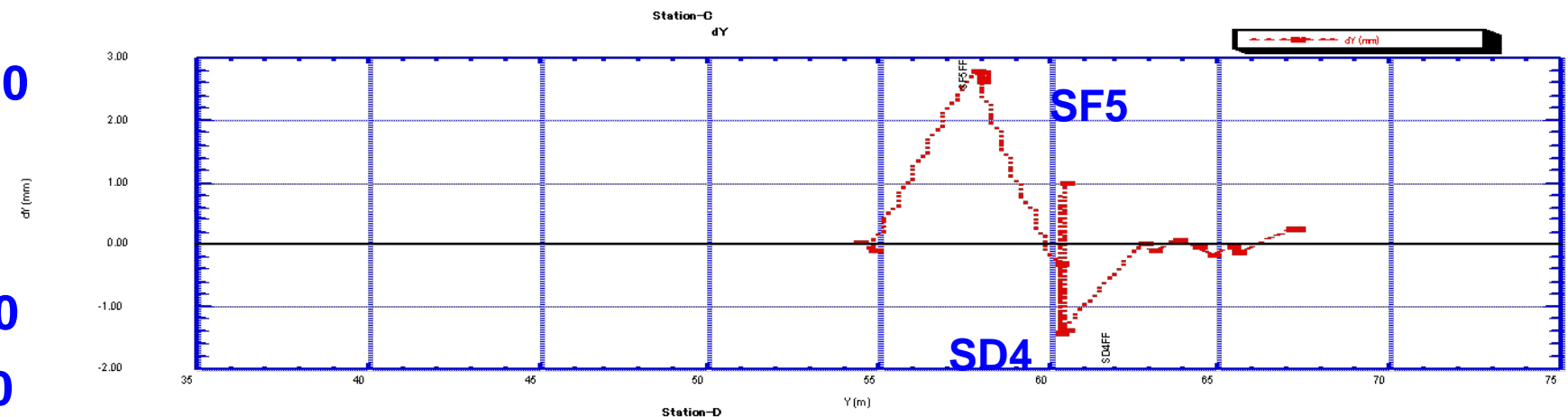
10.0

0.0
-2.0



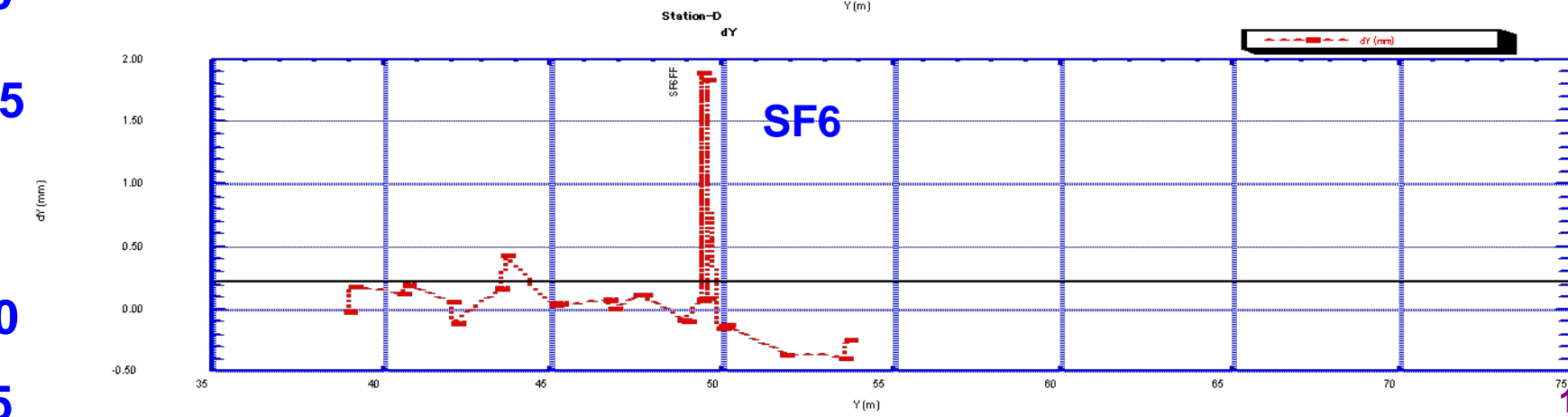
+3.0

0.0
-1.0

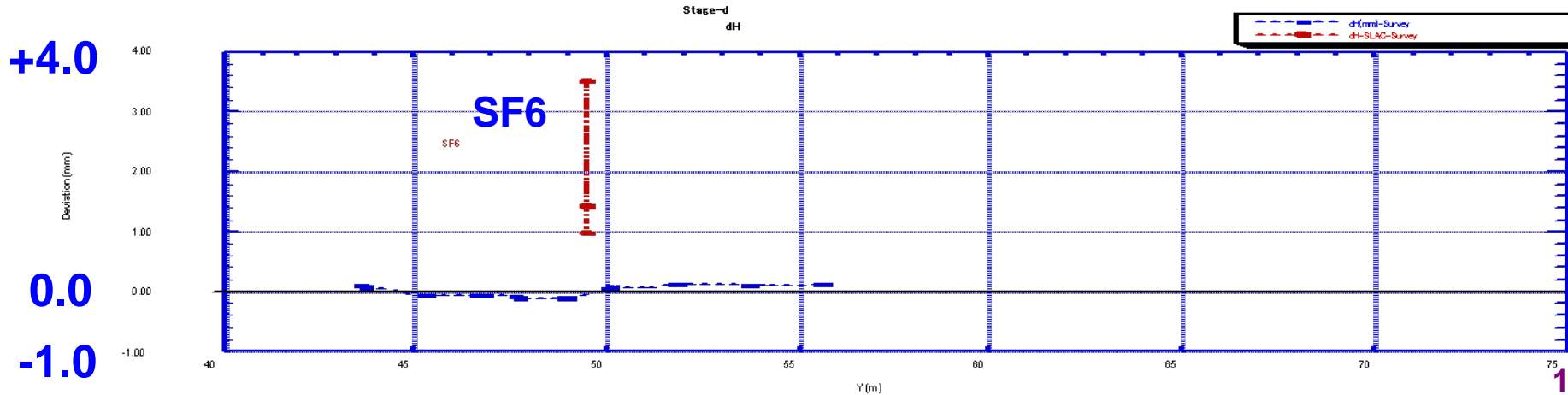
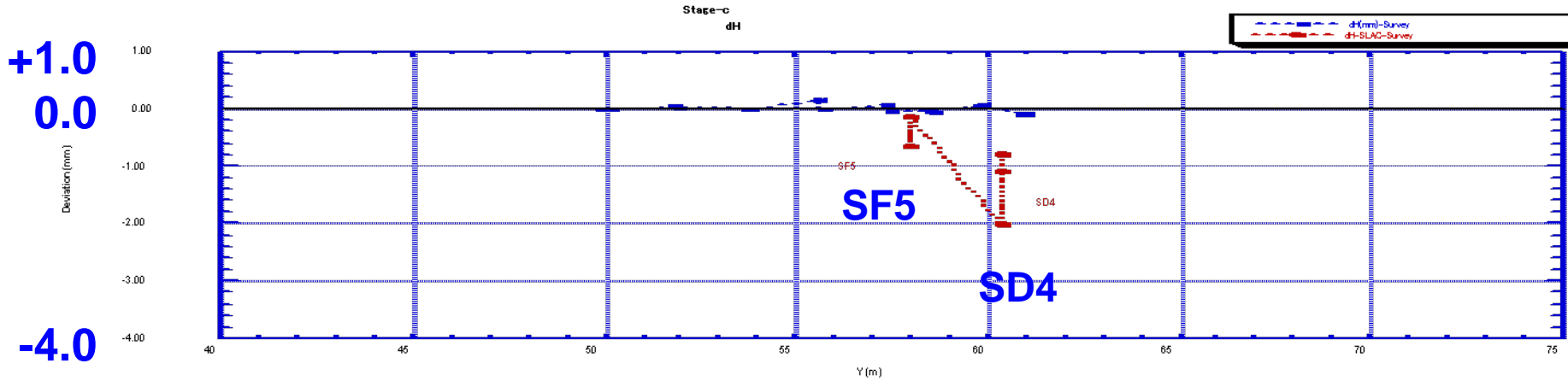
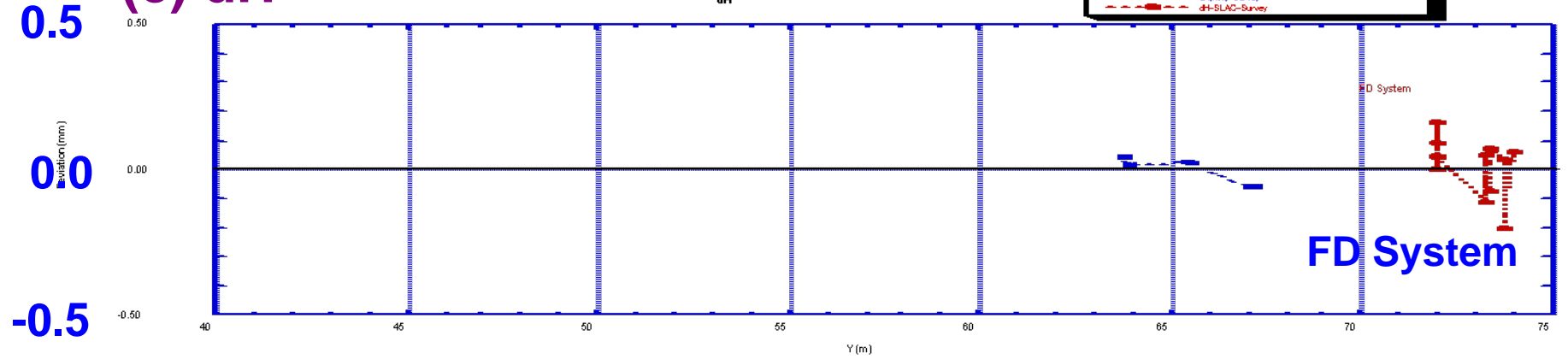


+1.5

0.0
-0.5



(c) dH



Level Survey at ATF2
2009.07.22–24

