Output of ELEGANT Correction Results *.scor

Case1, offset error = 30 μm, roll error = 100 μrad

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Printout for SDDS file tpsii-hoa-bvb-2s4sh-error_v5-rf-cx1cy1_step2_cycle1_test6.scor
```

x

Iteration	Cycle	Krms rad	Prms m	Kmax rad	Pmax m	Cdelta	Stage
0	0	0.000000e+00	1.314893e-03	0.000000e+00	3.538629e-03	0.000000e+00	uncorrected
1	0	4.269358e-05	6.253691e-04	1.602939e-04	1.713354e-03	0.000000e+00	intermediate
2	0	5.341410e-05	3.827960e-04	1.882409e-04	1.050020e-03	0.000000e+00	intermediate
3	0	5.883532e-05	2.444253e-04	1.937849e-04	6.467678e-04	0.000000e+00	intermediate
4	0	6.171223e-05	1.597221e-04	2.078005e-04	4.081890e-04	0.000000e+00	intermediate
5	0	6.326210e-05	1.058098e-04	2.155745e-04	2.672728e-04	0.000000e+00	intermediate
6	0	6.411306e-05	7.066500e-05	2.202002e-04	1.765125e-04	0.000000e+00	intermediate
7	0	6.459232e-05	4.742758e-05	2.230877e-04	1.172082e-04	0.000000e+00	intermediate
8	0	6.487109e-05	3.193386e-05	2.249400e-04	7.897775e-05	0.000000e+00	intermediate
9	0	6.503944e-05	2.154983e-05	2.261478e-04	5.346007e-05	0.000000e+00	intermediate
10	0	6.514521e-05	1.456669e-05	2.269445e-04	3.620806e-05	0.000000e+00	intermediate
11	0	6.521422e-05	9.859306e-06	2.274749e-04	2.454190e-05	0.000000e+00	intermediate
12	0	6.526075e-05	6.680269e-06	2.278311e-04	1.664874e-05	0.000000e+00	intermediate
13	0	6.529296e-05	4.530286e-06	2.280720e-04	1.130421e-05	0.000000e+00	intermediate
14	0	6.531571e-05	3.074550e-06	2.282361e-04	7.682128e-06	0.000000e+00	intermediate
15	0	6.533199e-05	2.087926e-06	2.283485e-04	5.225053e-06	0.000000e+00	intermediate
16	0	6.534375e-05	1.418694e-06	2.284260e-04	3.556690e-06	0.000000e+00	intermediate
17	0	6.535230e-05	9.644334e-07	2.284796e-04	2.422836e-06	0.000000e+00	intermediate
18	0	6.535854e-05	6.559082e-07	2.285168e-04	1.651591e-06	0.000000e+00	intermediate
19	0	6.536309e-05	4.462541e-07	2.285428e-04	1.126578e-06	0.000000e+00	intermediate
20	0	6.536643e-05	3.037198e-07	2.285609e-04	7.689139e-07	0.000000e+00	corrected

y

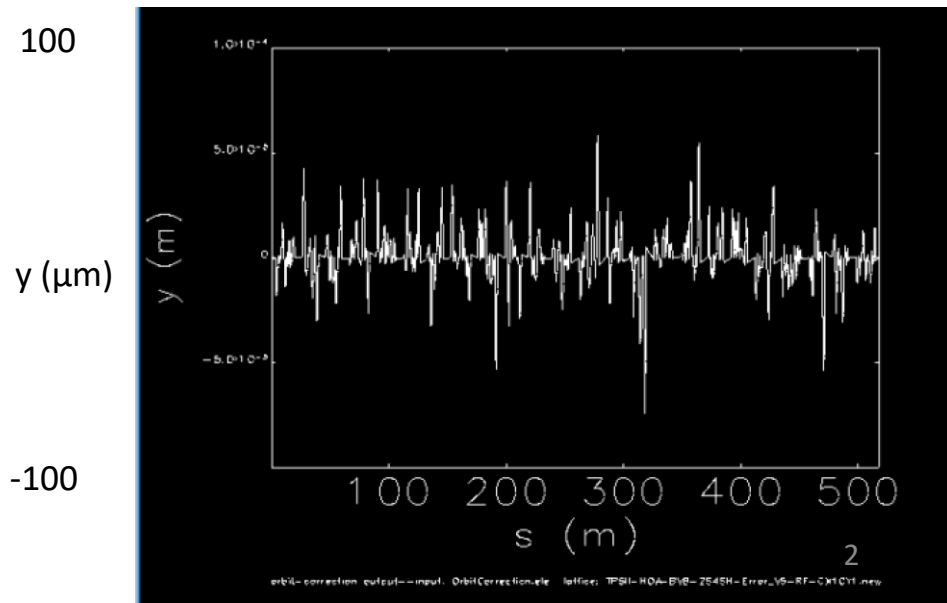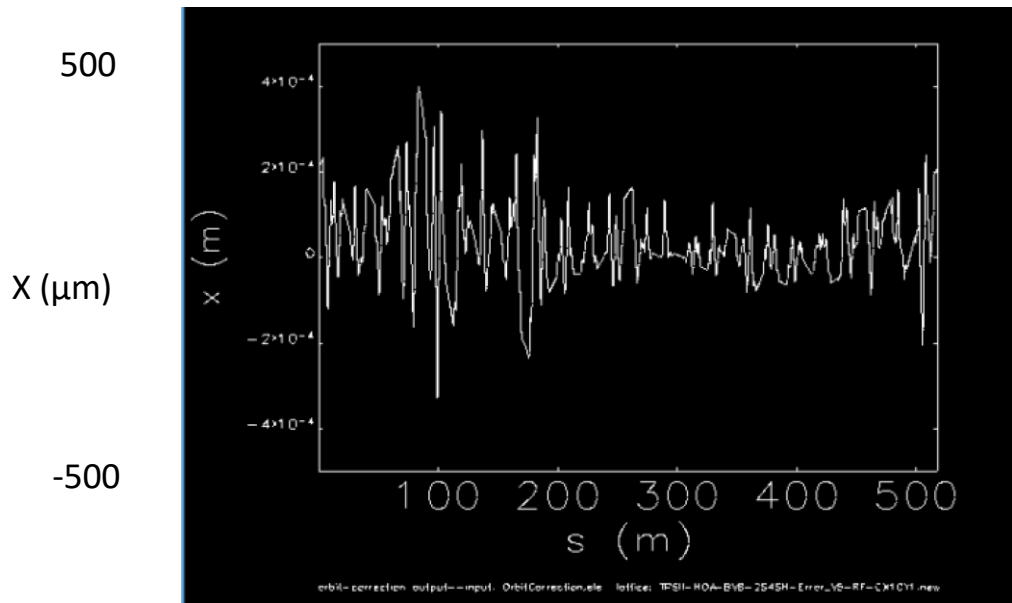| Iteration	Cycle	Krms rad	Prms m	Kmax rad	Pmax m	Cdelta	Stage
0	0	0.000000e+00	1.197544e-03	0.000000e+00	2.510988e-03	0.000000e+00	uncorrected
1	0	1.492563e-05	5.200650e-04	3.913861e-05	1.192825e-03	0.000000e+00	intermediate
2	0	2.215638e-05	2.769290e-04	5.845251e-05	5.978026e-04	0.000000e+00	intermediate
3	0	2.570350e-05	1.678617e-04	6.806949e-05	3.127279e-04	0.000000e+00	intermediate
4	0	2.746367e-05	1.052425e-04	7.287654e-05	1.894950e-04	0.000000e+00	intermediate
5	0	2.834345e-05	6.570224e-05	7.529067e-05	1.195819e-04	0.000000e+00	intermediate
6	0	2.878467e-05	4.056370e-05	7.650914e-05	7.387621e-05	0.000000e+00	intermediate
7	0	2.900627e-05	2.480623e-05	7.712723e-05	4.537502e-05	0.000000e+00	intermediate
8	0	2.911766e-05	1.506872e-05	7.744233e-05	2.756979e-05	0.000000e+00	intermediate
9	0	2.917369e-05	9.113878e-06	7.760375e-05	1.664102e-05	0.000000e+00	intermediate
10	0	2.920191e-05	5.497489e-06	7.768684e-05	1.000426e-05	0.000000e+00	intermediate
11	0	2.921615e-05	3.310863e-06	7.772982e-05	6.000167e-06	0.000000e+00	intermediate
12	0	2.922334e-05	1.992248e-06	7.775217e-05	3.593973e-06	0.000000e+00	intermediate
13	0	2.922698e-05	1.198299e-06	7.776385e-05	2.151378e-06	0.000000e+00	intermediate
14	0	2.922883e-05	7.206522e-07	7.777000e-05	1.287599e-06	0.000000e+00	intermediate
15	0	2.922978e-05	4.334062e-07	7.777325e-05	7.707066e-07	0.000000e+00	intermediate
16	0	2.923026e-05	2.606832e-07	7.777498e-05	4.614422e-07	0.000000e+00	intermediate
17	0	2.923051e-05	1.568196e-07	7.777591e-05	2.765837e-07	0.000000e+00	intermediate
18	0	2.923064e-05	9.435520e-08	7.777641e-05	1.661418e-07	0.000000e+00	intermediate
19	0	2.923070e-05	5.678211e-08	7.777668e-05	9.982006e-08	0.000000e+00	intermediate
20	0	2.923074e-05	3.417707e-08	7.777683e-05	5.998631e-08	0.000000e+00	corrected

Output of ELEGANT Correction *.orb

Case1, offset error = 30 μm, roll error = 100 μrad

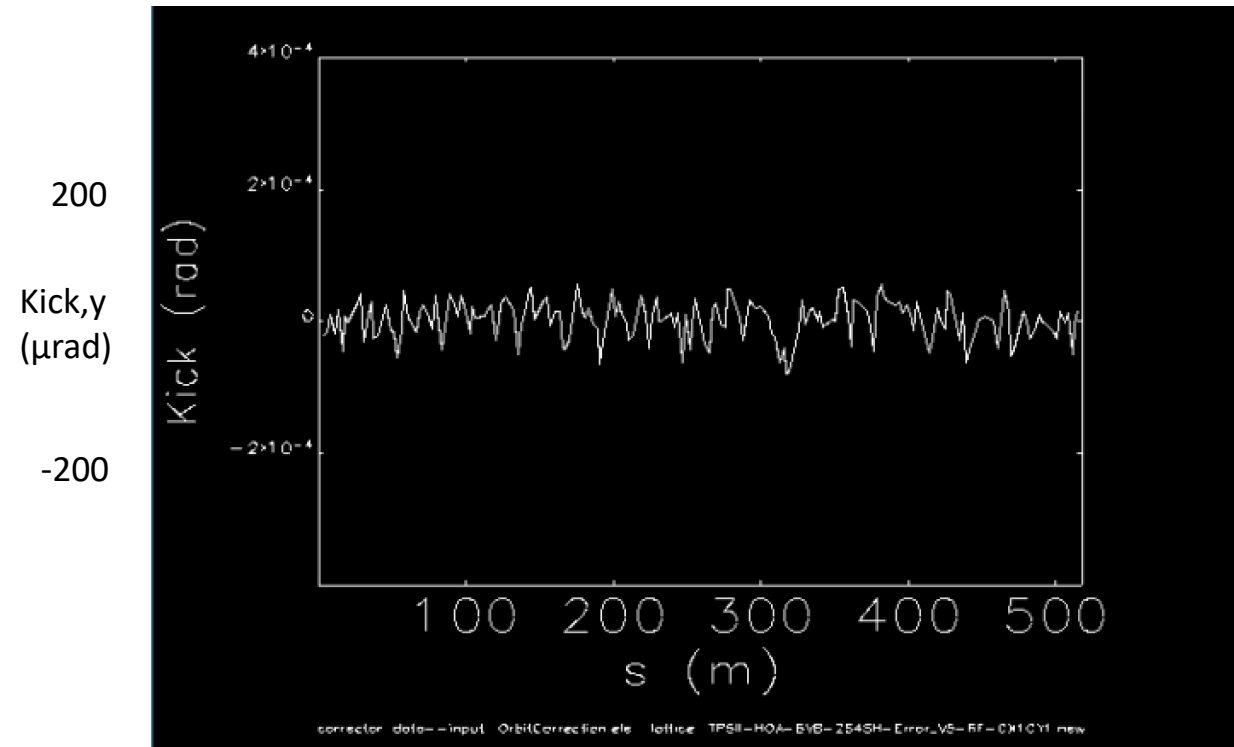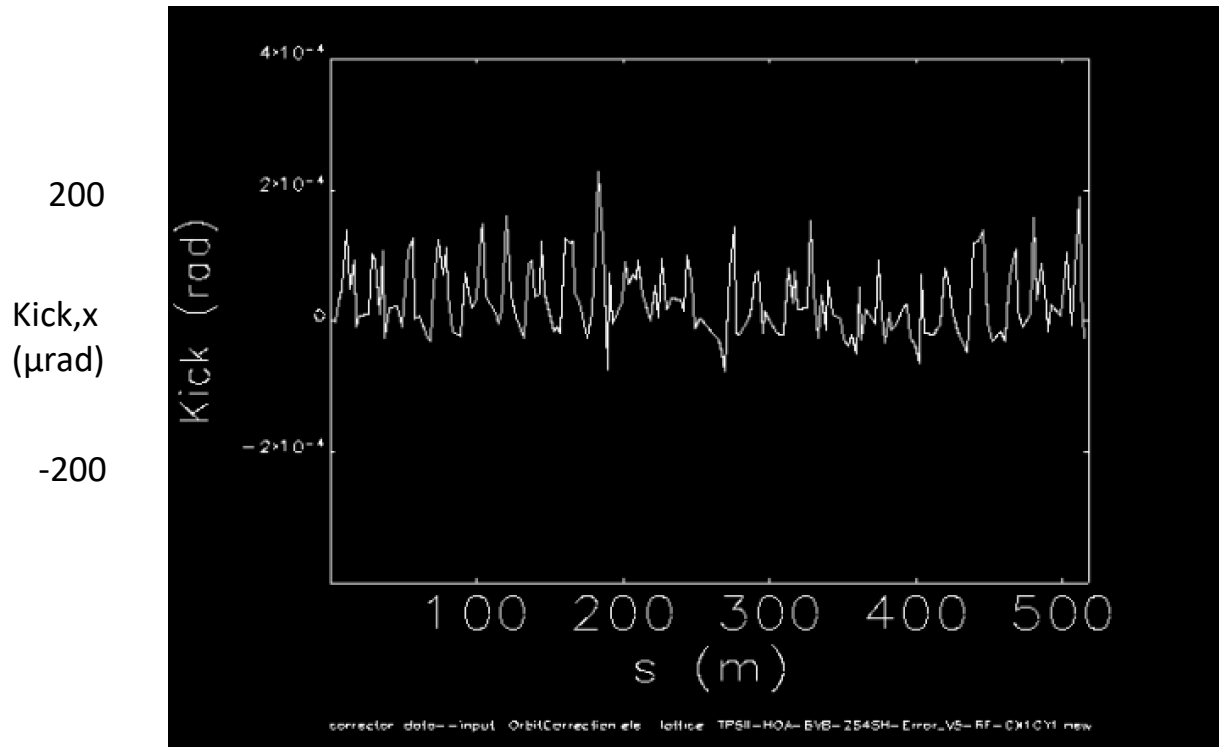Before correction

After correction

[note]
*.scor oupt shows
Xmax = 0.7 μm,
Ymax = 0.06 μm

?? The statistics results has large deviation from the figure information.

Output of ELEGANT Correction *.cor
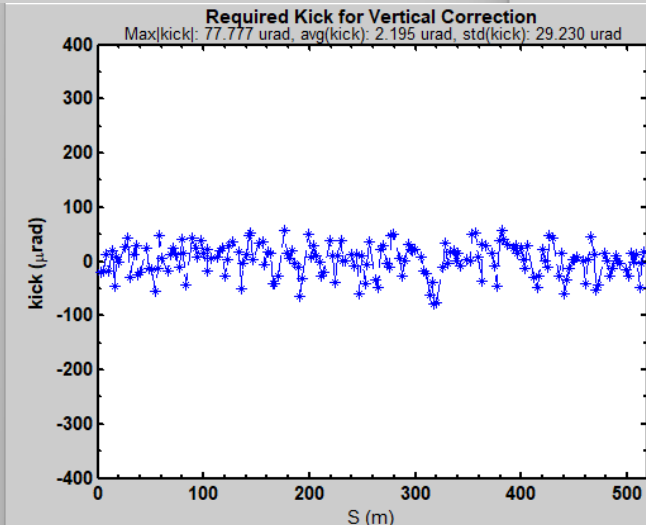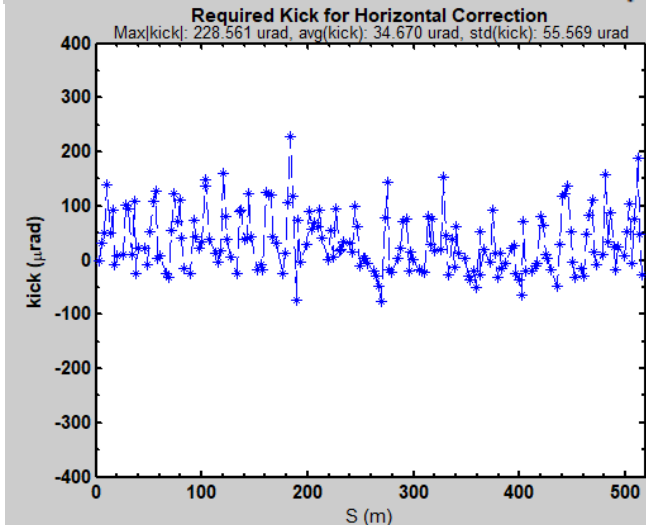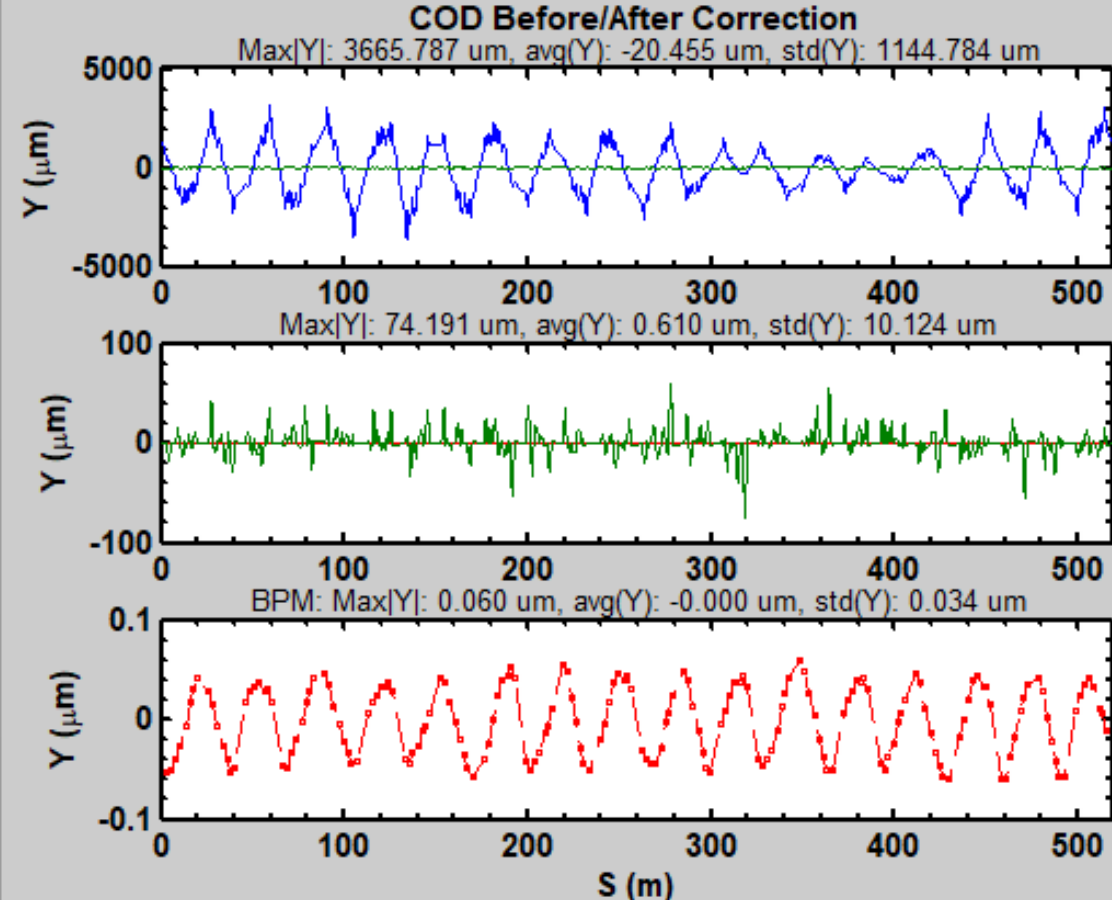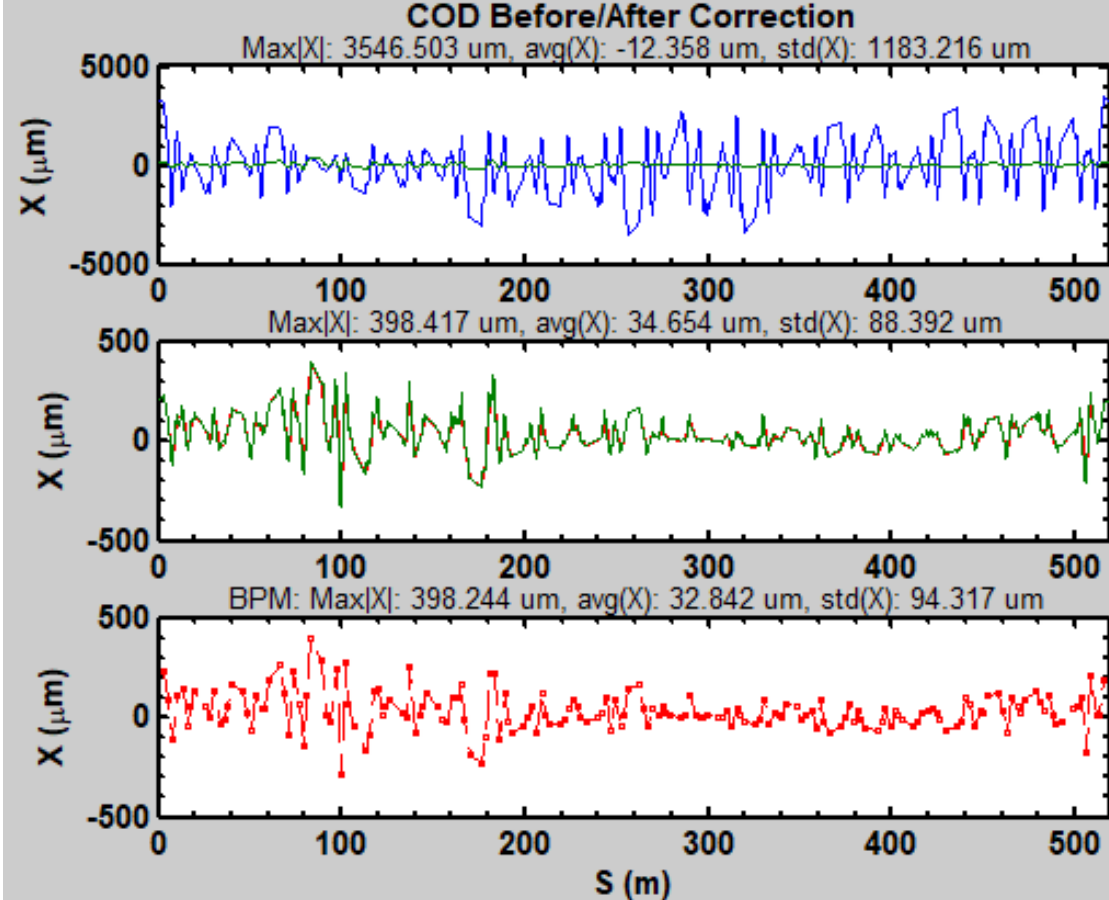
Case1, offset error = 30 μm, roll error = 100 μrad

Required kick in horizontal and vertical direction

[note] *.scor oupt
Kick,x,max = 228 μrad, Kick,y,max = 77 μrad
The statistic result from *.scor seems reasonable as shown in the *.cor figure

COD Before/After Correction
Max|X|: 3546.503 um, avg(X): -12.358 um, std(X): 1183.216 um

Max|X|: 398.417 um, avg(X): 34.654 um, std(X): 88.392 um

BPM: Max|X|: 398.244 um, avg(X): 32.842 um, std(X): 94.317 um

COD Before/After Correction
Max|Y|: 3665.787 um, avg(Y): -20.455 um, std(Y): 1144.784 um

Max|Y|: 74.191 um, avg(Y): 0.610 um, std(Y): 10.124 um

BPM: Max|Y|: 0.060 um, avg(Y): -0.000 um, std(Y): 0.034 um

Required Kick for Horizontal Correction
Max|kick|: 228.561 urad, avg(kick): 34.670 urad, std(kick): 55.569 urad

Required Kick for Vertical Correction
Max|kick|: 77.777 urad, avg(kick): 2.195 urad, std(kick): 29.230 urad

[note]
1. Double check the information from the raw data of *.orb, *.bpm and *.cor
2. The post-processing figures by MATLAB (*.orb and *.bpm) looks the same as ELEGANT sddsplot result.
3. The ELEGANT statistics result of kicker (*.cor) is the same as post-processing results by MATLAB
4. The statistics results of horizontal orbit has large deviation from the *.scor results

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Statistics After Correction

Case1, offset error = 30 µm, roll error = 100 µrad

	X_max (µm)	X_mean (µm)	X_rms(µm)	Kick,x_max (µrad)	Kick,x_mean (µrad)	Kick,x_rms (µrad)
ELEGANT	0.7	---	0.3	228.561	----	65.36
MATLAB BPM	|X|max 398.2	32.84	94.3	228.561	34.670	55.569
orbit	|X|max 398.4	34.65	88.3	----	----	----

	Y_max (µm)	Y_mean (µm)	Y_rms (µm)	Kick,y_max (µrad)	Kick,y_mean (µrad)	Kick,y_rms (µrad)
ELEGANT	0.06	---	0.03	77.777	----	29.23
MATLAB BPM	|Y|max 0.06	0	0.03	77.777	2.195	29.23
orbit	74	0.6	10.1	----	----	----

➤ The elegant .scor results seems to be the "BPM" and corrector statistics data
➤ The deviation occurs especially for the x orbit information, do not know why?