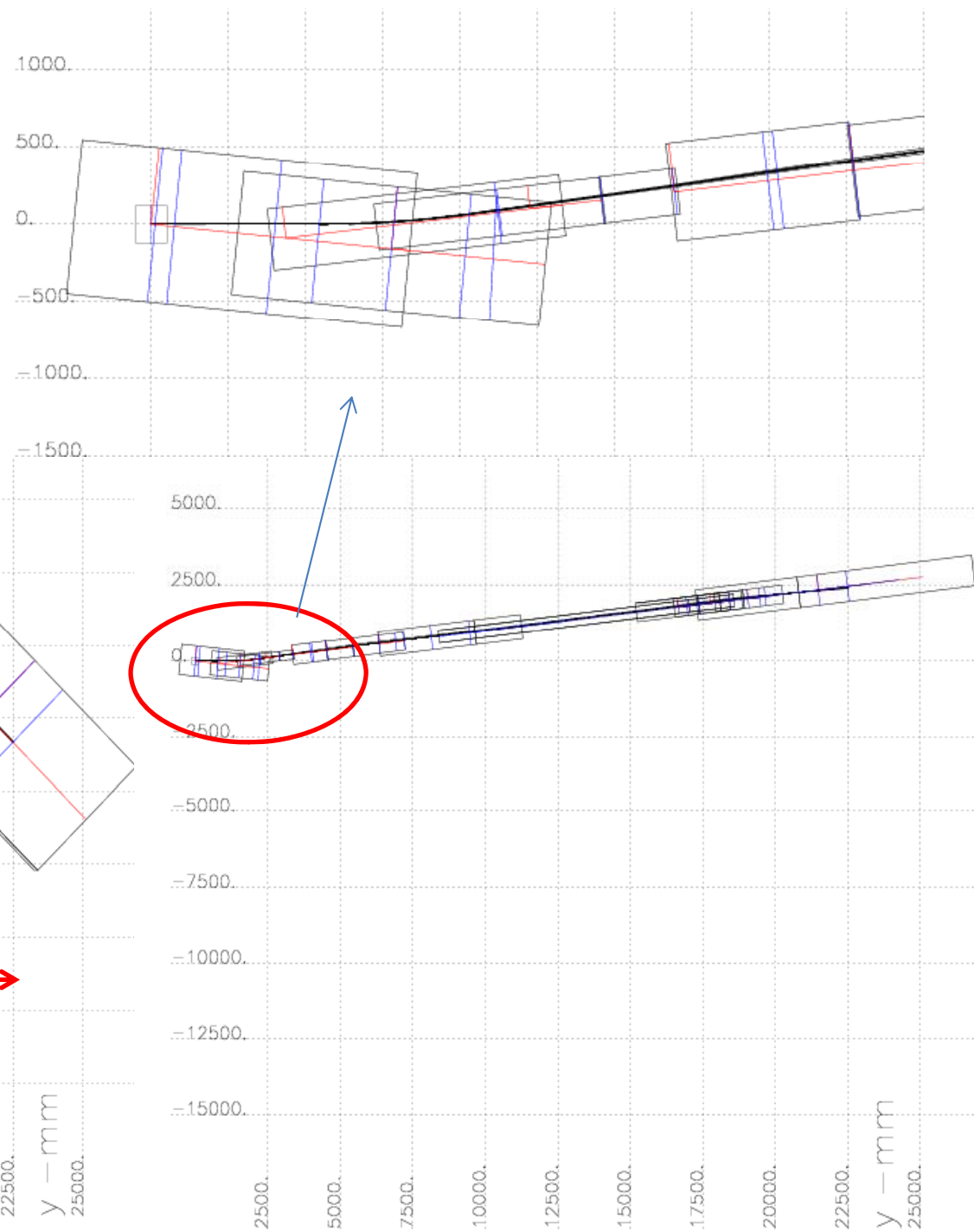
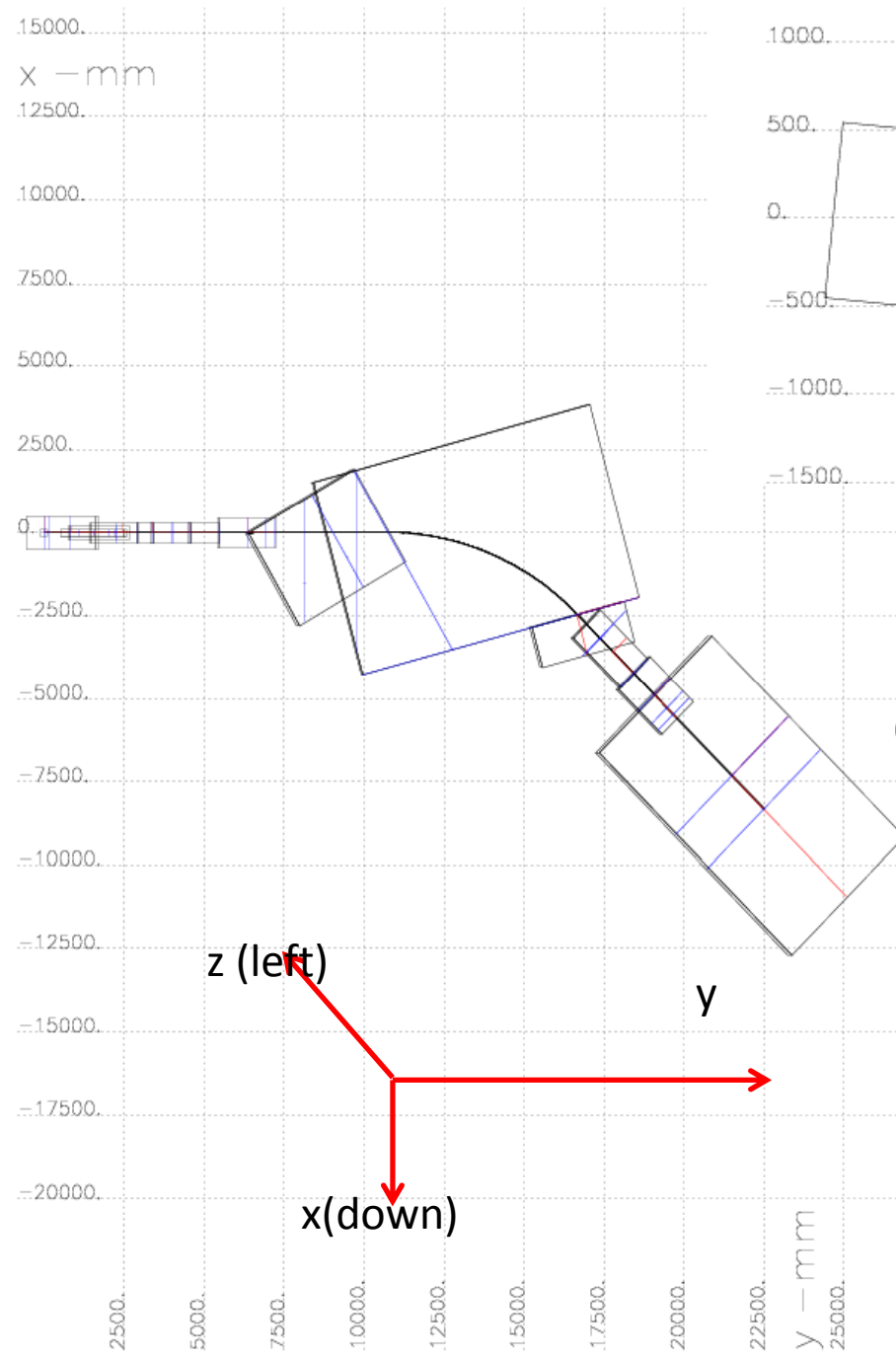


SNAKE Update

Min Huang

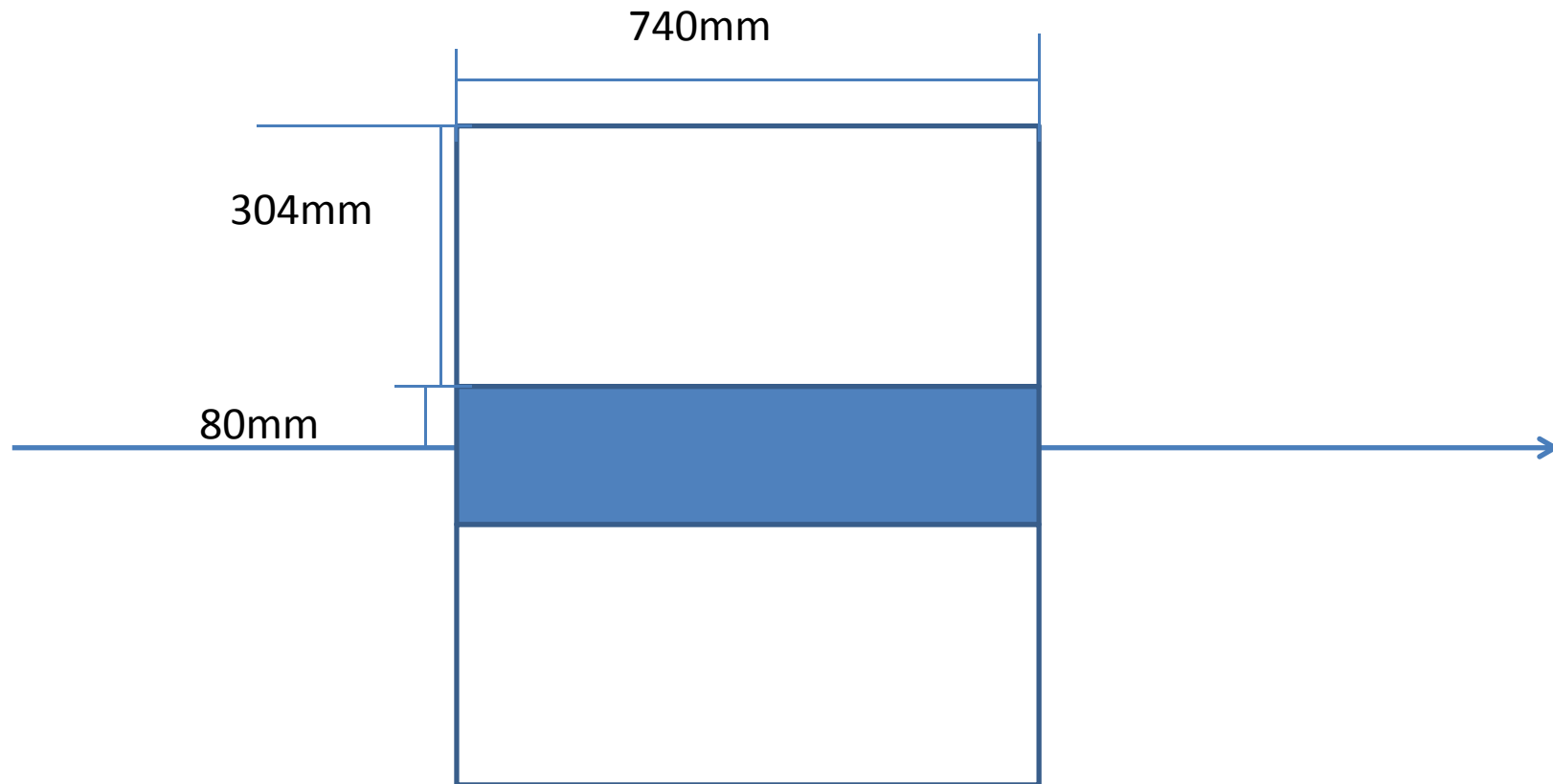
3/21/2013



tg center to hall center 876.93mm, septum center 686mm

	x	y	z	Angle z	Angle x	Angle y	Ref coord
Tg box	0	0	0	0	-5.77	0	TCS
septum	0	1555	-157	0	-5.77	0	TCS
Hall	0	872	-88	0	6.73	0	TCS
Q1entr	0	1590	1.96	0	0	0	HRS
Q1ext							Q1entr
Q1Q2							Q1ext
Q2entr							Q1ext
Q2ext							Q2entr
QDdrift							Q2ext
Dipole	-2460	15900	1.96	75	0	0	Hall
DQoverlap			1.96	75	0	0	Hall
Q3entr	-3586	17026	1.96	45	0	0	Hall
Q3ext							Q3entr
Drift							Q3ext

Septum Position



Coordinates

septum matching phi

	X(m)	Theta (rad)	Theta (deg)	Y(m)	Phi (rad)	Phi (deg)	Ref coord
start	-0.0015	0.0017		0.0058	-0.0071		TCS
Sieve	-1.48E-01	1.70E-03	9.74E-02	0.1542	-0.0071	-0.4068	TCS
septum1	-0.3651	-0.0019	-0.1064	107.8780	0.0984	5.6406	Hall
2	-1.3685	-0.0023	-0.1307	167.7020	0.1581	9.0567	
3	-2.4952	-0.0024	-0.1382	260.4090	0.2211	12.6709	
4	-2.9008	-0.0024	-0.1390	297.9410	0.2259	12.9454	
Q1en	2.9574	0.0024	0.1356	0.3919	0.0040	0.2316	HRS
Q1ex	5.4184	0.0008	0.0437	8.6404	0.0052	0.3006	
fp	6.0100	-0.0007	-0.0386	-7.4821	-0.0085	-0.4895	

Coordinates

septum matching y

	X(m)	Theta (rad)	Theta (deg)	Y(m)	Phi (rad)	Phi (deg)	Ref coord
start	-0.0015	0.0017		0.0058	-0.0071		TCS
Sieve	-0.1482	0.0017	0.0974	0.1542	-0.0071	-0.4068	TCS
septum1	-0.3653	-0.0019	-0.1066	107.8850	0.0986	5.6488	Hall
2	-1.3747	-0.0023	-0.1317	168.2570	0.1605	9.1962	
3	-2.5111	-0.0024	-0.1395	262.8010	0.2261	12.9545	
4	-2.9202	-0.0024	-0.1403	301.1500	0.2311	13.2396	
Q1en	2.9759	0.0024	0.1367	3.6660	0.0089	0.5112	HRS
Q1ex	5.4590	0.0008	0.0442	23.0505	0.0127	0.7267	
fp	5.8327	-0.0007	-0.0400	-16.2073	-0.0169	-0.9701	

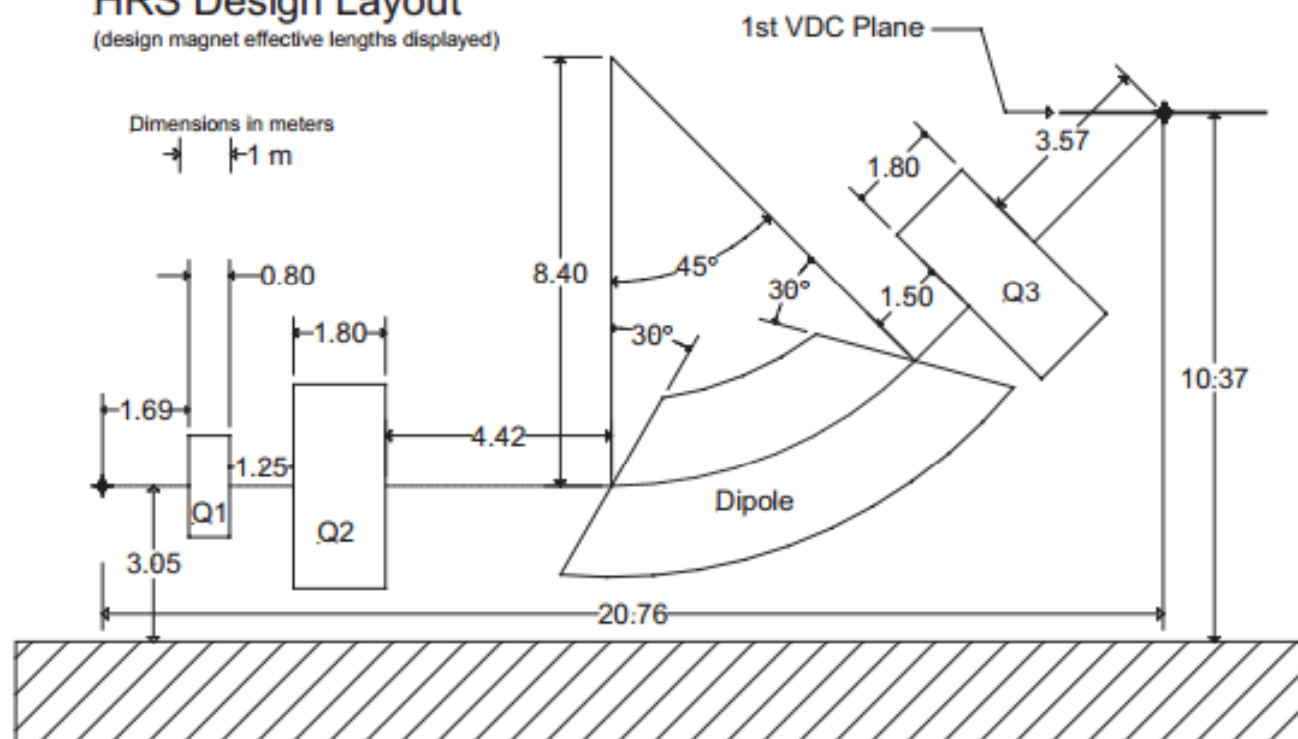
Coordinates

septum matching phi, start from (0,0,0,0)

'	X(m)	Theta (rad)	Theta (deg)	Y(m)	Phi (rad)	Phi (deg)	Ref coord
start	0	0		0	0		TCS
Sieve	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	TCS
septum1	-0.0149	-0.0001	-0.0085	109.8190	0.1057	6.0543	Hall
2	-0.2014	-0.0006	-0.0336	173.2300	0.1658	9.5019	
3	-0.5146	-0.0007	-0.0420	269.7690	0.2293	13.1362	
4	-0.6391	-0.0008	-0.0430	308.5570	0.2340	13.4094	
Q1en	0.6552	0.0007	0.0419	11.0143	0.0117	0.6724	HRS
Q1ex	1.5140	0.0003	0.0187	39.1201	0.0191	1.0960	
fp	1.3877	-0.0004	-0.0235	-20.7908	-0.0184	-1.0558	

HRS Design Layout

(design magnet effective lengths displayed)



Uncertainty from First Order Matrix

	x0	theta0	y0	phi0	delta
x	-2.4269	-0.0038	-0.1460	-0.0986	1.34E+01
Theta	-0.2196	-0.4120	-0.0146	0.0050	2.33E+00
Y	0.0070	0.1059	-0.0879	-2.0715	0.29695
phi	-0.0226	0.1549	0.4837	-1.1092	0.133477

HRS with 1.96mm
left offset,
w.r.t. trajectory
from C foil to sieve
center

$$\delta y_0 = 1.6\text{mm}, \delta \phi_0 = 2\text{mrad} \rightarrow \delta y = 4\text{mm}, \delta \phi = 2.3\text{mrad}$$

Backup

- Beam position (Hall coordinate)
 - $x=4.373\pm1.658$ mm
 - $y=1.503\pm1.018$ mm
 - $\theta=0.00177\pm0.001179$ rad
 - $\phi=0.005534\pm0.0018$ rad

Current Result

- After tuning septum field, taking phi or y as priority to match

	X(mm)	Theta(mrad)	Y(mm)	Phi(mrad)
data	2.52	0.49	-16.19	-8.47
SNAKE (y)	5.93	-0.70	-16.21	-16.93
SNAKE (phi)	6.00	-0.67	-7.43	-8.50

- Reference: (0,0,,0,0) start point, no HRS offset

	X(mm)	Theta(mrad)	Y(mm)	Phi(mrad)
SNAKE (y)	1.9	-0.3	-6.33E-03	2.783
SNAKE (phi)	1.9	-0.3	-2.87	9.79E-04

First Order Matrix

	x0	theta0	y0	phi0	delta
x	-2.43E+00	-9.88E-02	-1.85E-01	-4.21E-01	1.34E+01
Theta	-2.17E-01	-4.21E-01	-2.02E-02	-4.86E-02	2.32E+00
Y	-3.37E-02	1.64E-01	-1.29E-01	-1.96E+00	
phi	-5.25E-02	2.24E-01	4.46E-01	-9.95E-01	

HRS with
1.96mm left
offset

	x0	theta0	y0	phi0	delta
x	-2.42E+00	4.97E-02	-6.40E-02	-1.17E-01	1.35E+01
Theta	-2.26E-01	-4.08E-01	5.32E-04	-4.73E-03	2.33E+00
Y	3.33E-02	4.19E-02	-1.13E-01	-1.93E+00	
phi	2.43E-02	5.08E-02	4.59E-01	-9.88E-01	

HRS no
offset