

SNAKE Update

Min Huang

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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

$\delta y_0 = 1.6\text{mm}$, $\delta \varphi_0 = 2\text{mrad}$, **y0 φ_0 are linearly correlated**
 $\rightarrow \delta y = 4\text{mm}$, $\delta \varphi = 1.5\text{mrad}$

Current Result

- Tuning septum field, taking phi or y as priority to match
- Consider $\delta y=4\text{mm}$ 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
SNAKE (middle)	5.94	-0.68	-12.05	-12.95

- φ difference is about 4.5mrad, $\delta\varphi=1.5\text{mrad}$

Underway & Next Plan

- Tuning Q1 field (was using EPICS current)
 - Vertically focusing
- Study the sieve hole projected closer to focal plane center
- Use more other holes to tweak the parameters in SNAKE model

Backup

- Beam position (Hall coordinate)
 - $x=4.373\pm 1.658$ mm
 - $y=1.503\pm 1.018$ mm
 - $\theta=0.00177\pm 0.001179$ rad
 - $\phi=0.005534\pm 0.0018$ 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
SNAKE (middle)	5.94	-0.68	-12.05	-12.95

- 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