Stochastic COSY

Asymmetric absorber

01.30.14

Last Time

- Problem with very small disagreements (~μm, eV)
- Fixed by generating offsets (x, y) = (10, 10) [cm]; (px, py) = (10, 10) [MeV]
- Stochastic COSY was declared successful with flat absorbers only

Position units are in cm, momentum units are in MeV. Simulations done with 10,000 muons

This Time

- Similar offsets with asymmetric absorber (30° opening angle, 60° closing angle with respect to the x-axis)
- Simulations were all done separately, leaving the rest of the transverse coordinates zeroed (on average)

	ICOOL	COSY	% Disagreement (w.r.t. ICOOL)
x	9.966	9.968	0.020
σx	43.14	43.20	0.139

	ICOOL	COSY	% Disagreement (w.r.t. ICOOL)
px	9.907	9.902	0.050
σpx	10.34	10.28	0.580

	ICOOL	COSY	% Disagreement (w.r.t. ICOOL)
y	9.921	9.923	0.020
σy	41.70	41.91	0.504

	ICOOL	COSY	% Disagreement (w.r.t. ICOOL)
py	9.816	9.807	0.092
σpy	10.020	10.08	0.599

Momentum units are in MeV, simulations done with 11 muons.

Transverse Momenta I

- px range was ±7.5% total energy
- All other transverse coordinates were zero
- All discrepancies were within the tested ICOOL vs. ICOOL range (~1%)
- Values reported are the total momentum

px initial	COSY	ICOOL	%
-15	190.8	192.5	0.86
-12	190.3	192.3	1.05
-9	189.8	189.7	0.03
-6	189.3	188.7	0.35
-3	188.9	190.1	0.63
0	188.6	189.4	0.42
3	188.3	189.6	0.70
6	188.0	188.8	0.43
9	187.8	187.7	0.07
12	187.7	187.5	0.09
15	187.5	186.9	0.33

Momentum units are in MeV, simulations done with 11 muons.

Transverse Momenta II

- Total transverse momentum range was ±7.1% total energy (roughly)
- All other transverse coordinates were zero
- All discrepancies were within the tested ICOOL vs. ICOOL range (~1%)
- Values reported are the total momentum

px initial	py initial	COSY	ICOOL	%
10	-10	188.0	185.9	1.10
8	-8	188.0	187.5	0.26
6	-6	188.1	188.4	0.15
4	-4	188.2	188.5	0.16
2	-2	188.4	188.1	0.15
0	0	188.6	189.6	0.52
2	2	188.4	189.1	0.36
4	4	188.2	188.3	0.05
6	6	188.1	187.6	0.29
8	8	188.0	186.1	1.05
10	10	188.0	189.1	0.57