Study2/Study2a Target Solenoid Comparison

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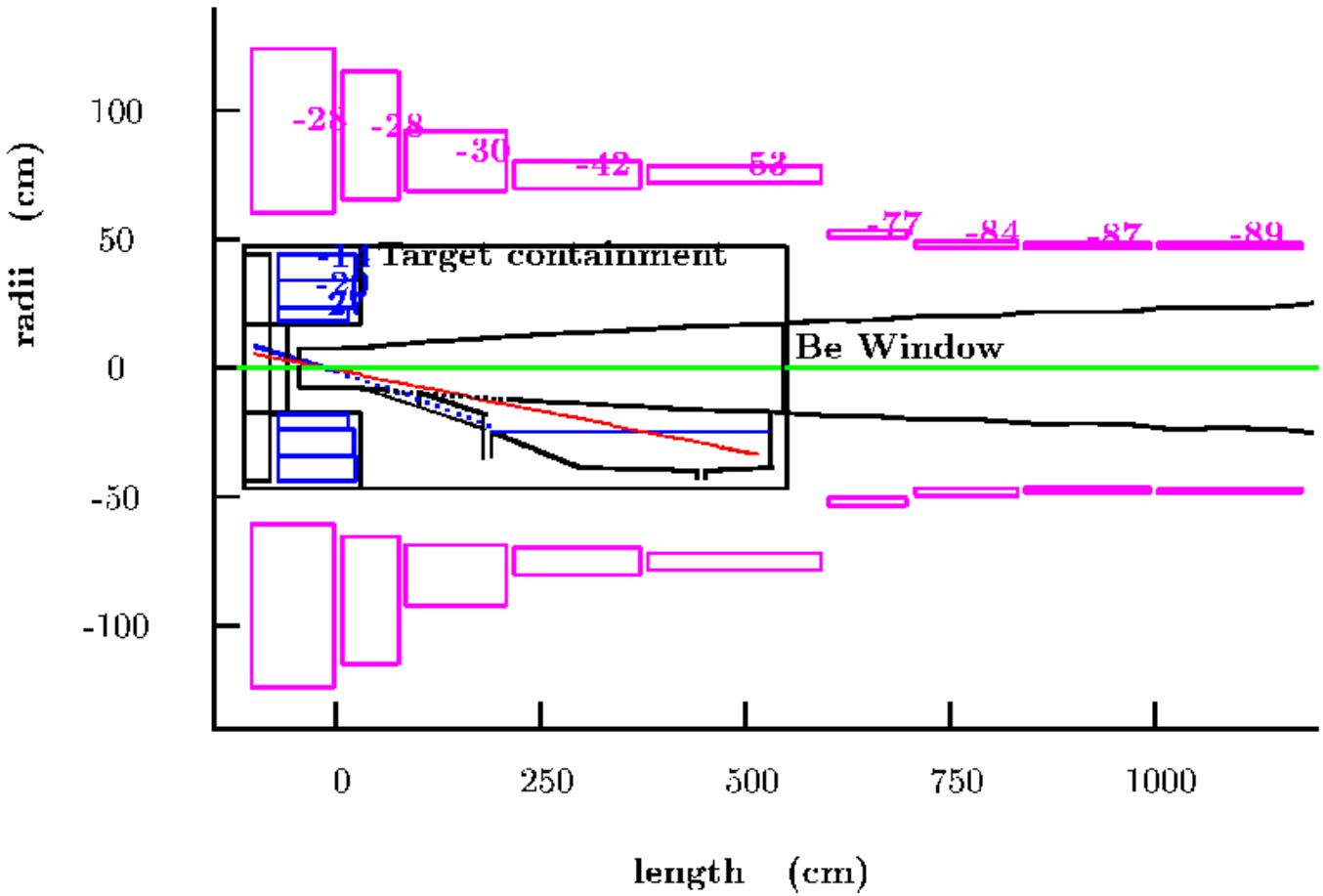
The Study2 Target



The solenoid parameters

	z (m)	Gap (m)	Δz (m)	R_i (m)	ΔR (m)	I/A (A/mm^2)	nI (A)	nIl (A-m)
Fe	0.980	0.980	0.108	0.000	0.313	0.00	0.00	0.00
	1.088	0.000	0.312	0.000	0.168	0.00	0.00	0.00
Cu coils	1.288	−0.112	0.749	0.178	0.054	24.37	0.98	1.26
	1.288	−0.749	0.877	0.231	0.122	19.07	2.04	3.74
	1.288	−0.877	1.073	0.353	0.137	14.87	2.18	5.78
SC coils	0.747	−1.614	1.781	0.636	0.642	23.39	26.77	160.95
	2.628	0.100	0.729	0.686	0.325	25.48	6.04	32.23
	3.457	0.100	0.999	0.776	0.212	29.73	6.29	34.86
	4.556	0.100	1.550	0.776	0.107	38.26	6.36	33.15
	6.206	0.100	1.859	0.776	0.066	49.39	6.02	30.59
	8.000	−0.065	0.103	0.416	0.051	68.32	0.36	1.00
	8.275	0.172	2.728	0.422	0.029	69.27	5.42	14.88
	11.053	0.050	1.749	0.422	0.023	75.62	3.00	8.18
	12.852	0.050	1.750	0.422	0.019	77.37	2.61	7.09
	14.652	0.050	1.749	0.422	0.017	78.78	2.30	6.22
	16.451	0.050	1.750	0.422	0.015	79.90	2.07	5.59
	18.251	0.050	2.366	0.422	0.013	-0.85	2.53	6.80

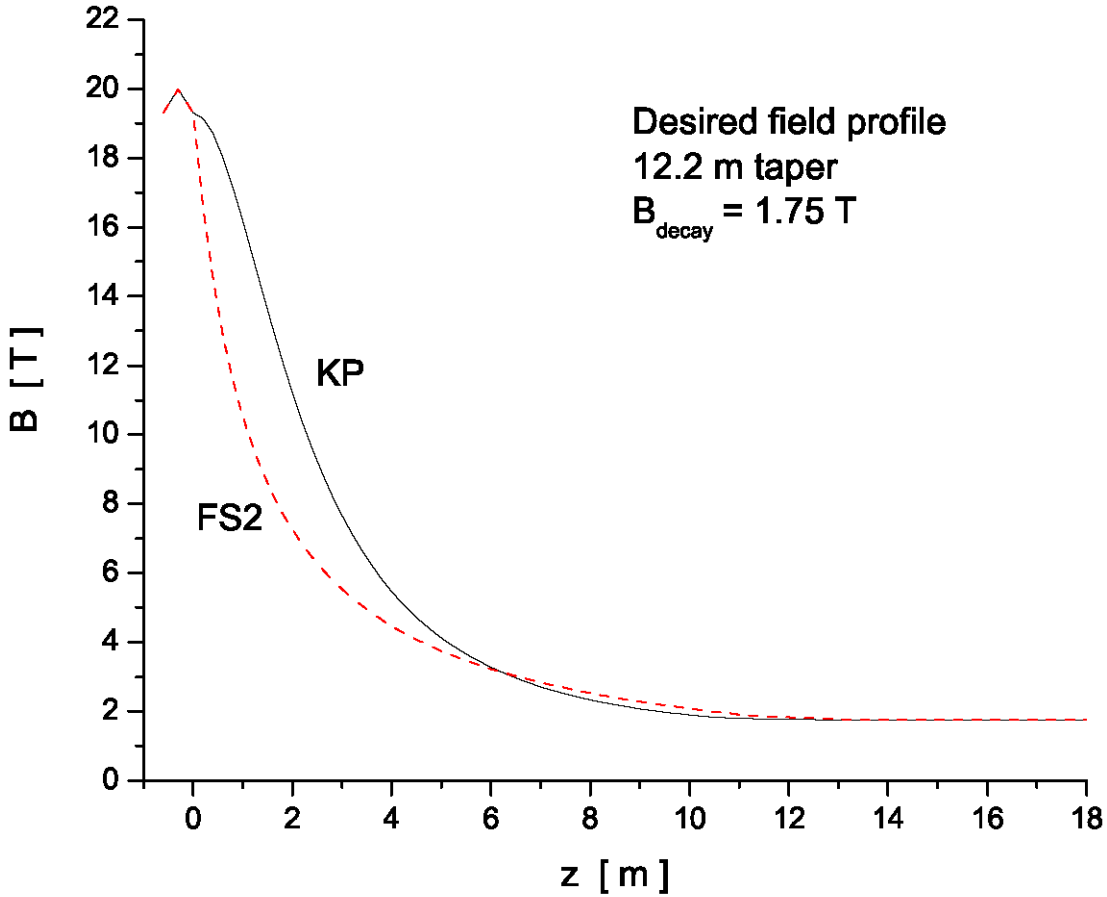
# Z0[cm]	dZ[cm]	R0[cm]	dR[cm]
-120.3d0	178.1d0	63.6d0	64.2d0
67.8d0	72.9d0	68.6d0	32.5d0
150.7d0	99.9d0	77.6d0	21.2d0
260.6d0	155.0d0	77.6d0	10.7d0
425.6d0	185.9d0	77.6d0	6.6d0
605.0d0	10.3d0	41.6d0	5.1d0
632.5d0	272.8d0	42.2d0	2.9d0
910.3d0	174.9d0	42.2d0	2.3d0
1090.2d0	175.0d0	42.2d0	1.9d0
1270.2d0	174.9d0	42.2d0	1.7d0
1450.1d0	175.0d0	42.2d0	1.5d0
1630.1d0	236.6d0	42.2d0	1.3d0
1871.7d0	3128.0d0	42.2d0	1.2d0

Study2 Solenoid Parameters

MARS Solenoid Parameters

There is a 1.95m shift between the two parameter sets
The iron plug ends at -0.55m (with the -1.95m shift).
The end of the iron plug is at -0.75m in the MARS simulation

Study2a Field Taper



New field taper improves muon collection by 10%

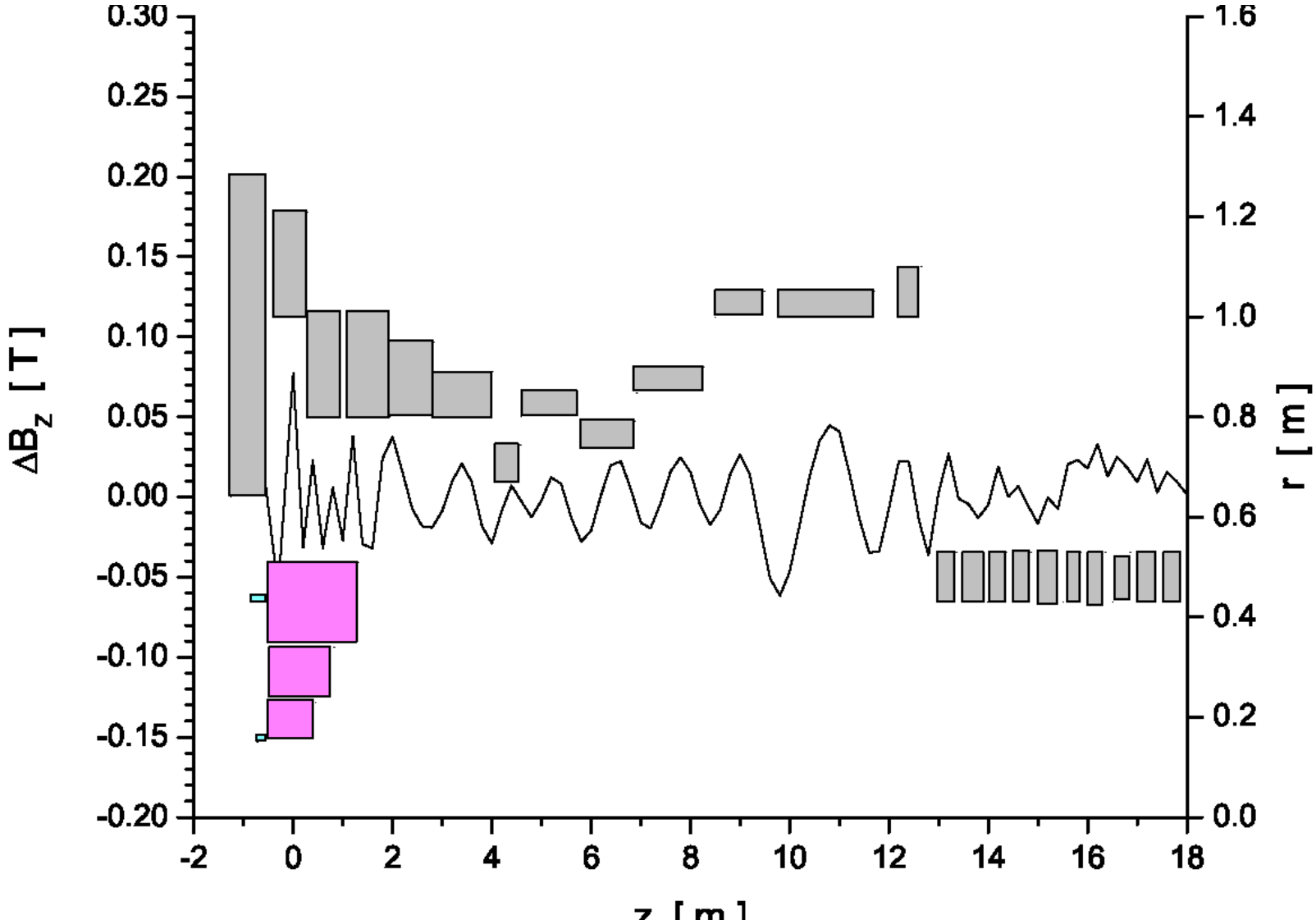
Generation of New Field Taper

TABLE I: Magnetic Lattice Components: target, capture, matching, drift sections

Target and Capture Section					
No. (Type)	z–position (m)	Length (m)	Radius (m)	Thick^{ness} (m)	Curr^{ent} density (A/mm^2)
1 (SC)	-1.252	0.683	0.640	0.640	52.87
2 (Fe)	-0.846	0.326	0.430	0.010	29.29
3 (Fe)	-0.726	0.206	0.150	0.010	46.36
4 (Cu)	-0.500	0.948	0.160	0.070	16.52
5 (Cu)	-0.500	1.320	0.240	0.100	19.69
6 (Cu)	-0.500	1.791	0.350	0.160	20.96
7 (SC)	-0.400	0.690	1.000	0.210	26.23
8 (SC)	0.310	0.640	0.800	0.210	52.95
9 (SC)	1.070	0.850	0.800	0.210	63.02
10 (SC)	1.940	0.880	0.800	0.150	47.09
11 (SC)	2.840	1.160	0.800	0.090	56.74
12 (SC)	4.100	0.470	0.673	0.070	45.97
13 (SC)	4.590	1.127	0.800	0.050	65.18
14 (SC)	5.803	1.070	0.740	0.050	44.00
15 (SC)	6.910	1.360	0.849	0.050	39.77
16 (SC)	8.500	0.990	1.000	0.050	45.69
17 (SC)	9.800	1.900	1.000	0.050	32.01
18 (SC)	12.180	0.470	1.000	0.100	42.96

Fernow/Gallardo May, 2004

The Study2a Solenoid Layout



The ICOOL Solenoid Input File

Front end coils for study2A (KP profile for 0.075,0.24907,12.2)

490

1	-1.252	0.683	0.640	0.640	52.870	5
2	-0.846	0.326	0.430	0.010	29.290	2
3	-0.726	0.206	0.150	0.010	46.360	2
4	-0.500	0.948	0.160	0.070	16.520	5
5	-0.500	1.320	0.240	0.100	19.690	5
6	-0.500	1.791	0.350	0.160	20.960	5
7	-0.400	0.690	1.000	0.210	26.230	5
8	0.310	0.640	0.800	0.210	52.950	5
9	1.070	0.850	0.800	0.210	63.020	5
10	1.940	0.880	0.800	0.150	47.090	5
11	2.840	1.160	0.800	0.090	56.740	5
12	4.100	0.470	0.673	0.070	45.970	5
13	4.590	1.127	0.800	0.050	65.180	5
14	5.803	1.070	0.740	0.050	44.000	5
15	6.910	1.360	0.849	0.050	39.770	5
16	8.500	0.990	1.000	0.050	45.690	5
17	9.800	1.900	1.000	0.050	32.010	5
18	12.180	0.470	1.000	0.100	42.960	5
19	13.000	0.360	0.430	0.100	12.940	5
20	13.500	0.360	0.430	0.100	15.130	5
21	14.000	0.360	0.430	0.100	17.980	5
22	14.500	0.360	0.430	0.100	18.130	5