

Lattice and Magnet specifications for Muon Accelerator and Electron Model

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The following slides contain 8 tables arranged as follows:

- Lattices with combined-function D & pure F-quadrupole(s)
 - Muons
 - High and low magnetic field variants
 - Electrons
 - High and low electric field variants
- Lattices with combined-function D & combined-function F.
 - Muons
 - High and low magnetic field variants
 - Electrons
 - High and low electric field variants

Muon Lattice and Magnet specifications

10-20 GeV/c muons; cell tunes $\nu_x = \nu_y = 0.35$, $B_{\max} \leq 7$ Tesla,
 $W \geq 1/12 = .0833$, 11 MV/cell @ 200 MHz

Lattice	# cells	Cell length (metre)	Circumference (metre)	Drift1	Drift2	W	Pc GeV/c
F0D0	90	5.1	459	2	2	.0846	18.258
Doublet	83	4.0	332	2	0.5	.0878	18.916
Triplet	70	4.9	343	2	0.5	.0908	19.595

Radiation hard, DC magnets, vacuum chamber not included

Lattice	Element	Length (metre)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle (rad)	B-peak Tesla	Aperture (cm)
F0D0	D	0.743	5.722	34.89	10.64	.03491	6.906	6.0
F0D0	F	0.357	0	69.35	--	0	6.906	14.2
Doublet	D	0.988	4.837	39.94	13.04	.03785	6.990	7.25
Doublet	F	0.512	0	72.7	--	0	6.990	12.06
Triplet	D	1.20	4.885	34.63	13.38	.04488	6.752	6.0
Triplet	F	0.350	0	68.89	--	0	6.752	10.5

Muon Lattice and Magnet specifications

10-20 GeV/c muons; cell tunes $\nu_x = \nu_y = 0.35$, $B_{\max} \leq 4.5$ Tesla,
 $W \geq 1/12 = .0833$, 11 MV/cell @ 200 MHz

Lattice	# cells	Cell length (metre)	Circumference (metre)	Drift1 (metre)	Drift2 (metre)	W	Pc GeV/c
F0D0	96	5.7	547.2	2	2	.0843	18.438
Doublet	93	5.0	465	2	1	.0876	18.723
Triplet	78	5.7	444.6	2	0.5	.0899	19.684

Radiation hard, DC magnets, vacuum chamber not included

Lattice	Element	Length (metre)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle (rad)	B-peak Tesla	Aperture (cm)
F0D0	D	1.139	3.533	21.12	17.407	.03272	4.394	6.75
F0D0	F	0.561	0	40.66	--	0	4.394	15.0
Doublet	D	1.330	3.173	22.31	19.686	.03378	4.320	7.47
Doublet	F	0.670	0	41.55	--	0	4.320	13.65
Triplet	D	1.701	3.110	21.02	21.114	.04028	4.446	6.94
Triplet	F	0.4996	0	40.32	--	0	4.446	11.7

Electron Lattice and Magnet specifications

10-20 MeV/c electrons; cell tunes $\nu_x = \nu_y = 0.35$, $B_{\max} \leq 0.20$ Tesla,
 $W \geq 1/4 = .250$, 0.5 MV/cell @ 2.86 GHz

Lattice	# cells	Cell length (cm)	Circumference (metre)	Drift1 (cm)	Drift2 (cm)	W	Pc MeV/c
F0D0	27	40	10.8	15	15	.2586	17.908
Doublet	26	37	9.62	15	5	.2628	18.560
Triplet	23	46	10.58	15	5	.2676	19.095

Radiation soft, DC magnets, vacuum chamber not included

Lattice	Element	Length (cm)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle (rad)	B-peak Tesla	Aperture (cm)
F0D0	D	9.149	0.1519	3.611	0.3932	0.1164	0.1929	1.95
F0D0	F	4.851	0	6.147	--	0	0.1929	4.41
Doublet	D	11.71	0.1277	3.666	0.4847	0.1208	0.1928	2.46
Doublet	F	6.29	0	6.194	--	0	0.1928	4.0
Triplet	D	13.0	0.1337	3.343	0.4762	0.1366	0.1924	2.08
Triplet	F	4.0	0	5.903	--	0	0.1924	3.69

Electron Lattice and Magnet specifications

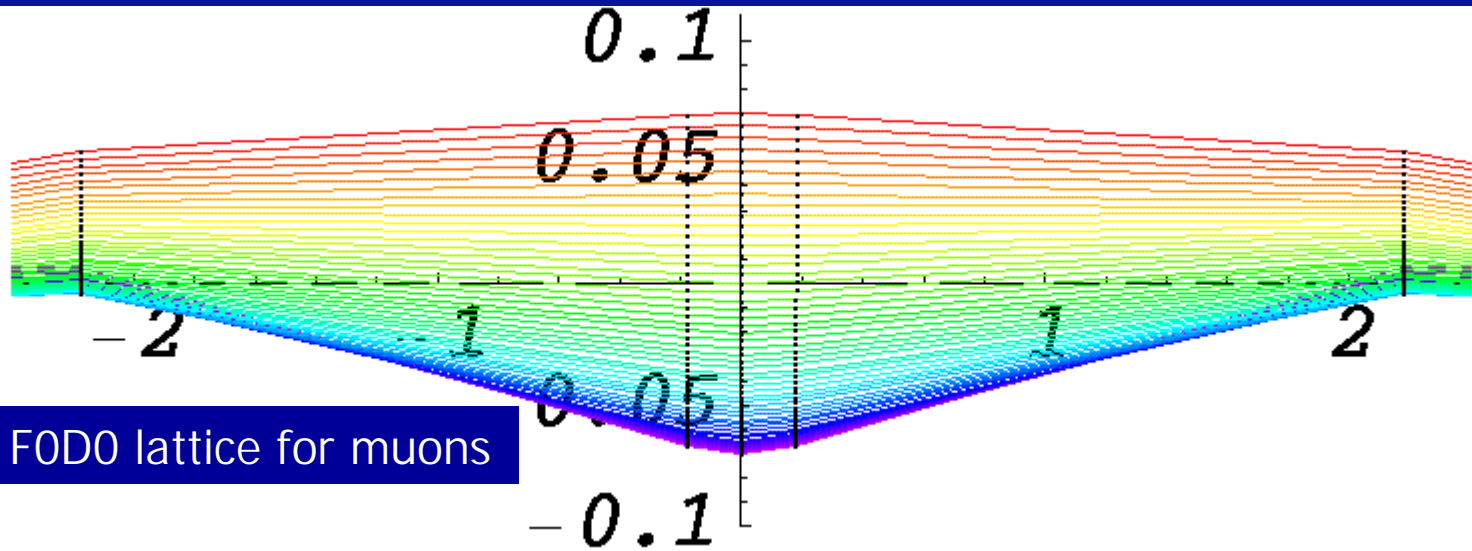
10-20 MeV/c electrons; cell tunes $\nu_x = \nu_y = 0.35$, $B_{\max} \leq 0.20$ Tesla,
 $W \geq 1/4 = .250$, 0.25 MV/cell @ 2.86 GHz

Lattice	# cells	Cell length (cm)	Circumference (metre)	Drift1 (cm)	Drift2 (cm)	W	Pc MeV/c
F0D0	36	40	14.4	15	15	.2599	17.973
Doublet	33	33	10.89	15	5	.2521	18.580
Triplet	29	41	11.89	15	5	.2595	19.147

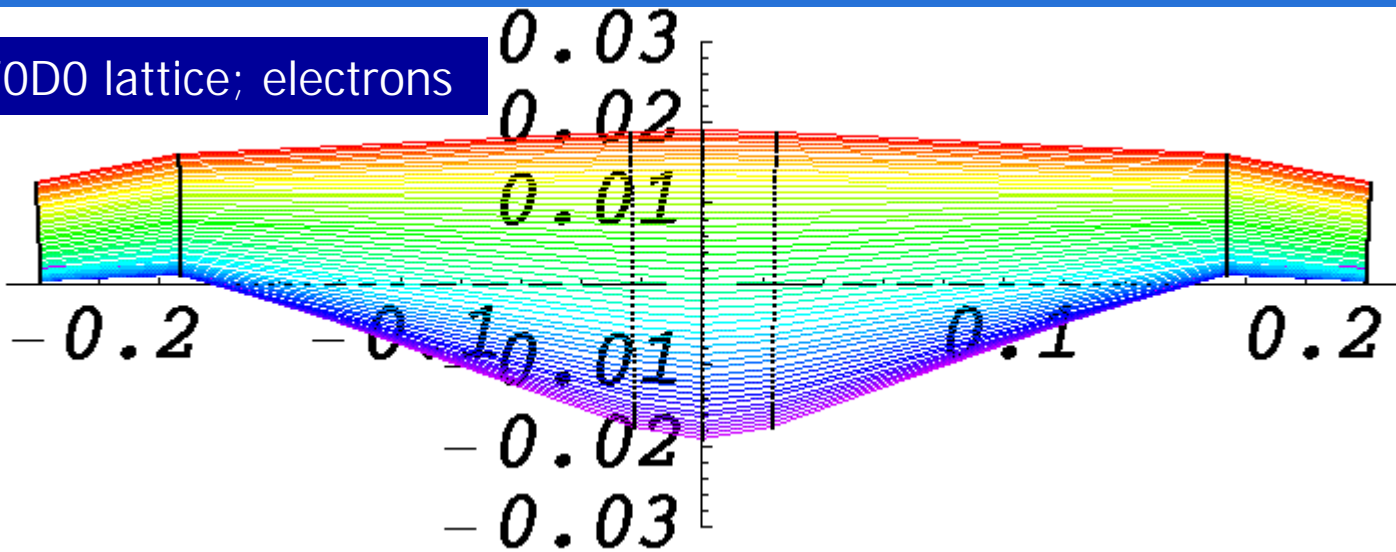
Radiation soft, DC magnets, vacuum chamber not included

Lattice	Element	Length (cm)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle (rad)	B-peak Tesla	Aperture (cm)
F0D0	D	6.63	0.1578	5.233	0.3799	.08727	0.1942	1.25
F0D0	F	3.37	0	9.490	--	0	0.1942	2.93
Doublet	D	9.80	0.1387	5.599	0.4467	.09520	0.1991	1.54
Doublet	F	5.20	0	9.754	--	0	0.1991	2.66
Triplet	D	10.0	0.1380	4.775	0.4629	0.1083	0.1902	1.31
Triplet	F	3.0	0	8.973	--	0	0.1902	2.40

90 Cell FODO lattice for muons



24 Cell FODO lattice; electrons



Muon Lattice and Magnet specifications

10-20 GeV/c muons; cell tunes $\nu_x = \nu_y = 0.35$, $B_{\max} \leq 7$ Tesla, sector D & F, $W \geq 1/12 = .0833$, 11 MV/cell @ 200 MHz

Lattice	# cells	Cell length (metre)	Circumference (metre)	Drift1	Drift2	W	Pc GeV/c
F0D0	90	5.1	459	2	2	.0863	16.799
Doublet	83	4.0	332	2	0.5	.0902	16.916
Triplet	74	4.9	343	2	0.5	.0846	16.223

Radiation hard, DC magnets, vacuum chamber not included

Lattice	Element	Length (metre)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle/2 (rad)	B-peak Tesla	Aperture (cm)
F0D0	D	0.742	6.262	35.04	8.949	.04147	6.880	5.9
F0D0	F	0.358	2.056	69.16	27.26	-.00656	6.880	14.0
Doublet	D	0.978	5.746	40.45	9.820	.04977	6.785	6.8
Doublet	F	0.522	2.574	71.31	21.92	-.01192	6.785	11.8
Triplet	D	1.198	5.721	34.95	9.458	.06334	6.943	6.1
Triplet	F	0.351	3.222	68.52	16.80	-.02089	6.943	10.9

Muon Lattice and Magnet specifications

10-20 GeV/c muons; cell tunes $\nu_x = \nu_y = 0.35$, $B_{\max} \leq 4.5$ Tesla, sector D & F,
 $W \geq 1/12 = .0833$, 11 MV/cell @ 200 MHz

Lattice	# cells	Cell length (metre)	Circumference (metre)	Drift1 (metre)	Drift2 (metre)	W	Pc GeV/c
F0D0	96	5.7	547.2	2	2	.0856	16.899
Doublet	93	5.0	465	2	1	.0895	16.973
Triplet	82	5.7	467.4	2	0.5	.0864	16.352

Radiation hard, DC magnets, vacuum chamber not included

Lattice	Element	Length (metre)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle/2 (rad)	B-peak Tesla	Aperture (cm)
F0D0	D	1.137	3.931	21.20	14.34	.03966	4.376	6.6
F0D0	F	0.563	1.389	40.51	40.59	-.00693	4.376	14.8
Doublet	D	1.320	3.666	22.51	15.44	.04273	4.236	7.1
Doublet	F	0.680	1.490	40.95	37.99	-.00895	4.236	13.5
Triplet	D	1.695	3.710	21.19	14.70	.05765	4.487	7.0
Triplet	F	0.502	2.100	20.07	25.98	-.01934	4.487	12.0

Electron Lattice and Magnet specifications

10-20 MeV/c electrons; cell tunes $\nu_x = \nu_y = 0.35$, $B_{\max} \leq 0.20$ Tesla,
 $W \geq 1/4 = .250$, 0.5 MV/cell @ 2.86 GHz

Lattice	# cells	Cell length (cm)	Circumference (metre)	Drift1 (cm)	Drift2 (cm)	W	Pc MeV/c
F0D0	24	44	10.56	15	15	.3223	14.825
Doublet	24	38	9.12	15	5	.3219	15.319
Triplet	23	43	9.89	15	5	.5294	13.857

Radiation soft, DC magnets, vacuum chamber not included

Lattice	Element	Length (cm)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle/2 (rad)	B-peak Tesla	Aperture (cm)
F0D0	D	9.314	0.1744	3.730	.2835	.1643	0.1899	1.5
F0D0	F	4.686	.0704	6.286	.7024	-.03335	0.1899	3.9
Doublet	D	11.66	0.1545	3.826	.3306	.1763	0.1819	2.0
Doublet	F	6.34	.0732	6.076	.6979	-.04542	0.1819	3.6
Triplet	D	11.64	0.1625	4.254	.2844	.2046	0.1945	1.25
Triplet	F	3.180	.0988	7.794	.4678	-.06800	0.1945	2.5

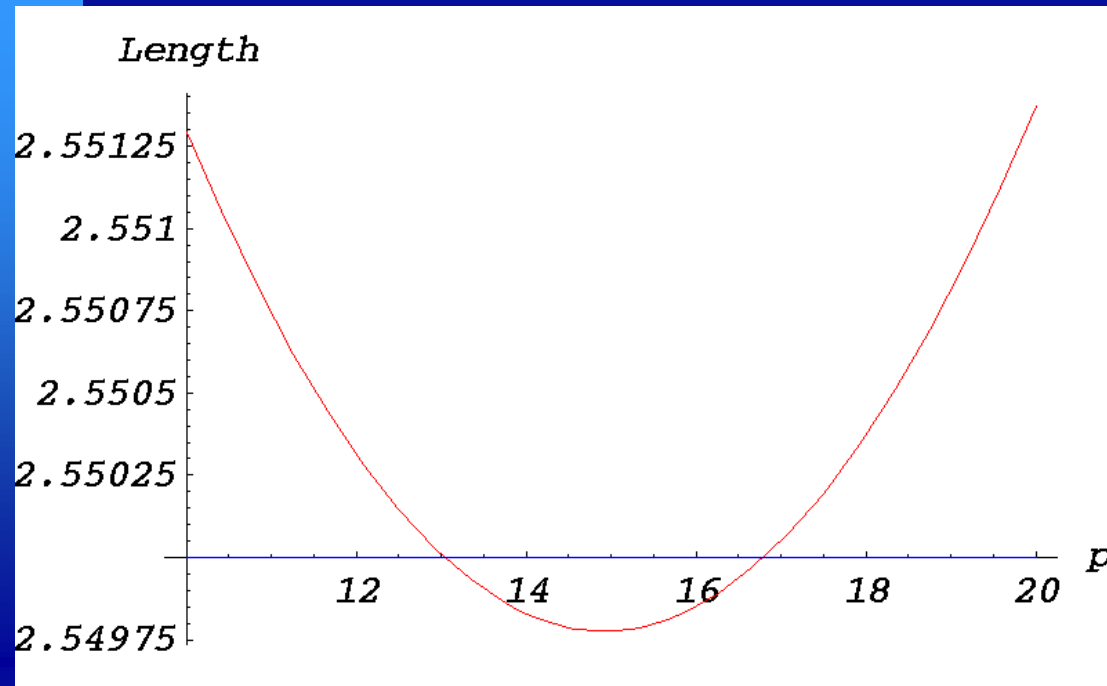
Electron Lattice and Magnet specifications

10-20 MeV/c electrons; cell tunes $\nu_x = \nu_y = 0.35$, $B_{\max} \leq 0.20$ Tesla,
 $W \geq 1/4 = .250$, 0.25 MV/cell @ 2.86 GHz

Lattice	# cells	Cell length (cm)	Circumference (metre)	Drift1 (cm)	Drift2 (cm)	W	Pc MeV/c
F0D0	34	40	13.6	15	15	.2762	15.857
Doublet	32	33	10.56	15	5	.2846	16.027
Triplet	28	41	11.48	15	5	.2976	14.712

Radiation soft, DC magnets, vacuum chamber not included

Lattice	Element	Length (cm)	Dipole (T)	Gradient (T/m)	Radius (m)	Angle/2 (rad)	B-peak Tesla	Aperture (cm)
F0D0	D	6.660	0.1779	5.344	.2974	.1120	0.1949	1.2
F0D0	F	3.340	.0620	9.522	.8531	-.01958	0.1949	2.8
Doublet	D	8.444	0.1631	5.766		.	0.1902	1.3
Doublet	F	4.556	.0718	9.568			0.1902	2.5
Triplet	D	10.0	0.1607	4.944	.3053	.1667	0.1934	1.2
Triplet	F	3.0	.0920	9.072	.5333	-.05455	0.1934	2.3



Path length variation for FODO muon lattice

Path length variation for FODO electron lattice

