XFEL
X-Ray Free-Electron Laser

DESY

XFEL Component Database

Winni Decking

FEL Beam Dynamics Meeting

26.11.2007

Concept of EXCEL List

- Started as tool to provide common data set for beam dynamics simulations
- Component count for initial (2005) XFEL budget book

- Extended to provide input for
  - 3D modelling
  - magnet family planning
  - power supply planning
  - power and utilities distribution
  - vacuum planning

- Linac (module) modeling only loosely coupled

Excel List Work Flow

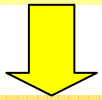
Lattice/Optics Specification and Development with Beam Optics Program (MAD) Calculation of Geometry, Optical Functions	MAD
↓	
Script to distribute names, further attributes, check geometry constrains, calculate cable length, combine data, etc.	MATLAB
↓	
Together with component properties (i.e. magnet data) power supply data is provided Together with beam optics data aperture information is calculated	EXCEL

Excel List Work Flow

Lattice/Optics Specification and Development with Beam Optics Program (MAD)

Calculation of Geometry, Optical Functions

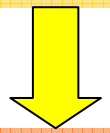
MAD



Script to distribute names, further attributes, check geometry constrains, calculate cable length, combine data, etc.

MATLAB

Walter Graeff



Together with component properties (i.e. magnet data) power supply data is provided

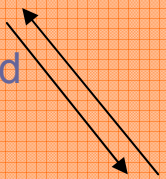
Together with beam optics data aperture information is calculated

List includes:

- Geometry
- Beam optics
- Aperture Data
- Power Supply Information
- Some Component Specifications

EXCEL

Bernie Krause, Sasha Petrov



Joerg Eckoldt, Jan Havlicek, Frank-R. Ullrich

Torsten Stoye, Katharina Jaehnke
Nils Mildner, Torsten Wohlenberg
Norbert Meyners

Excel List Work Flow

Lattice/Optics Specification and Development with Beam Optics Program (MAD) Calculation of Geometry, Optical Functions	MAD
↓	
Script to distribute names, further attributes, check geometry constrains, calculate cable length, combine data, etc.	MATLAB
↓	
Together with component properties (i.e. magnet data) power supply data is provided Together with beam optics data aperture information is calculated	EXCEL

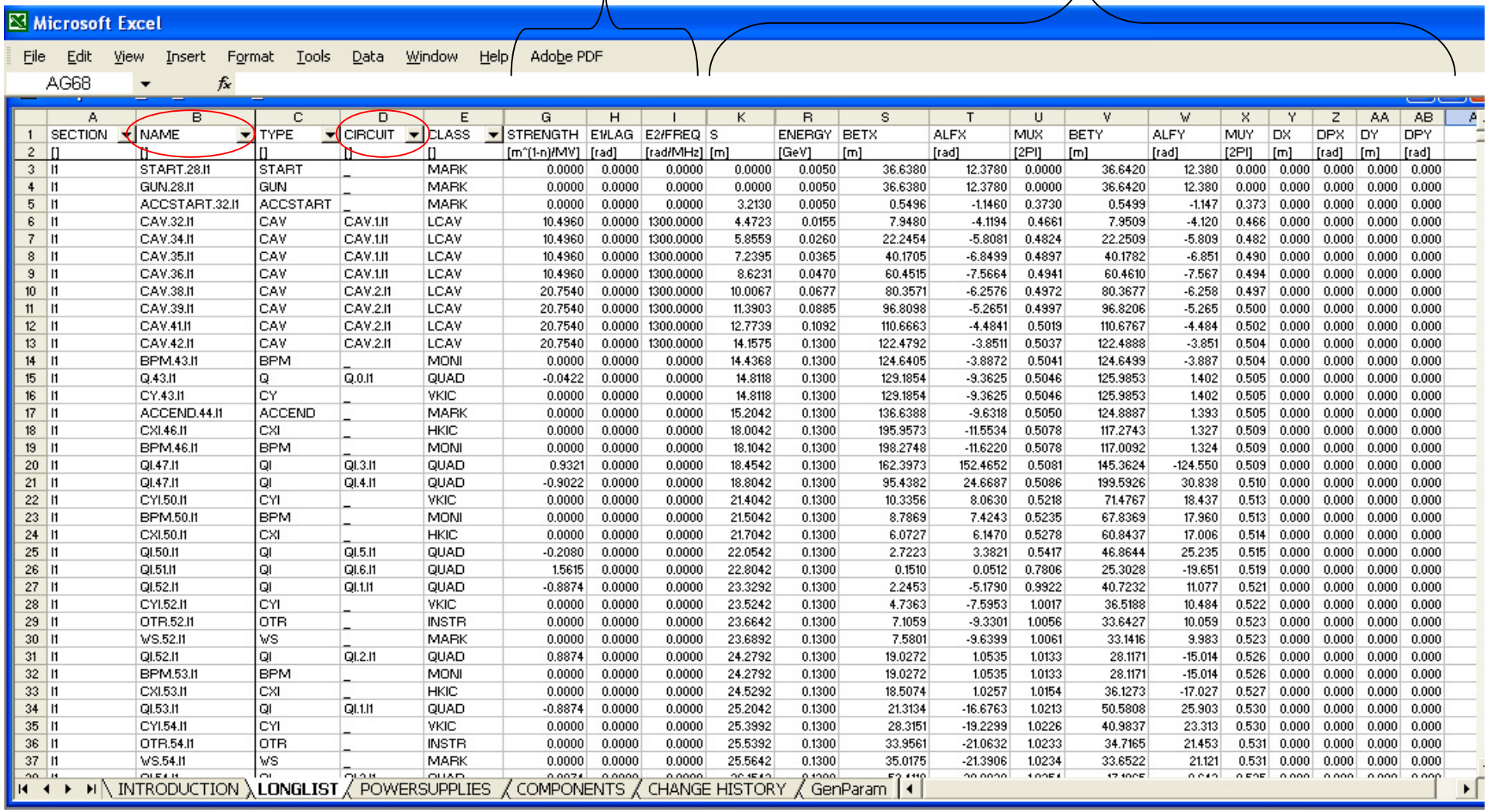
\+ Ensures consistent physical solution
\+ Single person maintenance ensures consistency

\- Single person maintenance needed for consistency
\- Difficult to incorporate additional beam line relevant data
\- Involves to many separate steps and manual work
\- Not a closed loop

Optics View

strength info

optic info



Microsoft Excel

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AG68

	A	B	C	D	E	G	H	I	K	R	S	T	U	V	W	X	Y	Z	AA	AB
1	SECTION	NAME	TYPE	CIRCUIT	CLASS	STRENGTH	E1/LAG	E2/FREQ	S	ENERGY	BETX	ALFX	MUX	BETY	ALFY	MUY	DX	DPX	DY	DPY
2	[]	[]	[]	[]	[]	[m^(1-n)/MV]	[rad]	[rad/MHz]	[m]	[GeV]	[m]	[rad]	[2PI]	[m]	[rad]	[2PI]	[m]	[rad]	[m]	[rad]
3	I1	START.28.I1	START	_	MARK	0.0000	0.0000	0.0000	0.0000	0.0050	36.6380	12.3780	0.0000	36.6420	12.380	0.000	0.000	0.000	0.000	0.000
4	I1	GUN.28.I1	GUN	_	MARK	0.0000	0.0000	0.0000	0.0000	0.0050	36.6380	12.3780	0.0000	36.6420	12.380	0.000	0.000	0.000	0.000	0.000
5	I1	ACCSTART.32.I1	ACCSTART	_	MARK	0.0000	0.0000	0.0000	3.2130	0.0050	0.5496	-1.1460	0.3730	0.5499	-1.147	0.373	0.000	0.000	0.000	0.000
6	I1	CAV.32.I1	CAV	CAV.1.I1	LCAV	10.4960	0.0000	1300.0000	4.4723	0.0155	7.9480	-4.1194	0.4661	7.9509	-4.120	0.466	0.000	0.000	0.000	0.000
7	I1	CAV.34.I1	CAV	CAV.1.I1	LCAV	10.4960	0.0000	1300.0000	5.8559	0.0260	22.2454	-5.8081	0.4824	22.2509	-5.809	0.482	0.000	0.000	0.000	0.000
8	I1	CAV.35.I1	CAV	CAV.1.I1	LCAV	10.4960	0.0000	1300.0000	7.2395	0.0365	40.1705	-6.8499	0.4897	40.1782	-6.851	0.490	0.000	0.000	0.000	0.000
9	I1	CAV.36.I1	CAV	CAV.1.I1	LCAV	10.4960	0.0000	1300.0000	8.6231	0.0470	60.4515	-7.5664	0.4941	60.4610	-7.567	0.494	0.000	0.000	0.000	0.000
10	I1	CAV.38.I1	CAV	CAV.2.I1	LCAV	20.7540	0.0000	1300.0000	10.0067	0.0677	80.3571	-6.2576	0.4972	80.3677	-6.258	0.497	0.000	0.000	0.000	0.000
11	I1	CAV.39.I1	CAV	CAV.2.I1	LCAV	20.7540	0.0000	1300.0000	11.3903	0.0885	96.8098	-5.2651	0.4997	96.8206	-5.265	0.500	0.000	0.000	0.000	0.000
12	I1	CAV.41.I1	CAV	CAV.2.I1	LCAV	20.7540	0.0000	1300.0000	12.7739	0.1092	110.6663	-4.4841	0.5019	110.6767	-4.484	0.502	0.000	0.000	0.000	0.000
13	I1	CAV.42.I1	CAV	CAV.2.I1	LCAV	20.7540	0.0000	1300.0000	14.1575	0.1300	122.4792	-3.8511	0.5037	122.4888	-3.851	0.504	0.000	0.000	0.000	0.000
14	I1	BPM.43.I1	BPM	_	MONI	0.0000	0.0000	0.0000	14.4368	0.1300	124.6405	-3.8872	0.5041	124.6499	-3.887	0.504	0.000	0.000	0.000	0.000
15	I1	Q.43.I1	Q	Q.0.I1	QUAD	-0.0422	0.0000	0.0000	14.8118	0.1300	129.1854	-9.3625	0.5046	125.9853	1.402	0.505	0.000	0.000	0.000	0.000
16	I1	CY.43.I1	CY	_	YKIC	0.0000	0.0000	0.0000	14.8118	0.1300	129.1854	-9.3625	0.5046	125.9853	1.402	0.505	0.000	0.000	0.000	0.000
17	I1	ACCEND.44.I1	ACCEND	_	MARK	0.0000	0.0000	0.0000	15.2042	0.1300	136.6388	-9.6318	0.5050	124.8887	1.393	0.505	0.000	0.000	0.000	0.000
18	I1	CXI.46.I1	CXI	_	HKIC	0.0000	0.0000	0.0000	18.0042	0.1300	195.9573	-11.5534	0.5078	117.2743	1.327	0.509	0.000	0.000	0.000	0.000
19	I1	BPM.46.I1	BPM	_	MONI	0.0000	0.0000	0.0000	18.1042	0.1300	198.2748	-11.6220	0.5078	117.0092	1.324	0.509	0.000	0.000	0.000	0.000
20	I1	QI.47.I1	QI	QI.3.I1	QUAD	0.9321	0.0000	0.0000	18.4542	0.1300	162.3973	152.4652	0.5081	145.3624	-124.550	0.509	0.000	0.000	0.000	0.000
21	I1	QI.47.I1	QI	QI.4.I1	QUAD	-0.9022	0.0000	0.0000	18.8042	0.1300	95.4382	24.6687	0.5086	199.5926	30.838	0.510	0.000	0.000	0.000	0.000
22	I1	CYI.50.I1	CYI	_	YKIC	0.0000	0.0000	0.0000	21.4042	0.1300	10.3356	8.0630	0.5218	71.4767	18.437	0.513	0.000	0.000	0.000	0.000
23	I1	BPM.50.I1	BPM	_	MONI	0.0000	0.0000	0.0000	21.5042	0.1300	8.7869	7.4243	0.5235	67.8369	17.960	0.513	0.000	0.000	0.000	0.000
24	I1	CXI.50.I1	CXI	_	HKIC	0.0000	0.0000	0.0000	21.7042	0.1300	6.0727	6.1470	0.5278	60.8437	17.006	0.514	0.000	0.000	0.000	0.000
25	I1	QI.50.I1	QI	QI.5.I1	QUAD	-0.2080	0.0000	0.0000	22.0542	0.1300	2.7223	3.3821	0.5417	46.8644	25.235	0.515	0.000	0.000	0.000	0.000
26	I1	QI.51.I1	QI	QI.6.I1	QUAD	1.5615	0.0000	0.0000	22.8042	0.1300	0.1510	0.0512	0.7806	25.3028	-19.651	0.519	0.000	0.000	0.000	0.000
27	I1	QI.52.I1	QI	QI.1.I1	QUAD	-0.8874	0.0000	0.0000	23.3292	0.1300	2.2453	-5.1790	0.9922	40.7232	11.077	0.521	0.000	0.000	0.000	0.000
28	I1	CYI.52.I1	CYI	_	YKIC	0.0000	0.0000	0.0000	23.5242	0.1300	4.7363	-7.5953	1.0017	36.5188	10.484	0.522	0.000	0.000	0.000	0.000
29	I1	OTR.52.I1	OTR	_	INSTR	0.0000	0.0000	0.0000	23.6642	0.1300	7.1059	-9.3301	1.0056	33.6427	10.059	0.523	0.000	0.000	0.000	0.000
30	I1	WS.52.I1	WS	_	MARK	0.0000	0.0000	0.0000	23.6892	0.1300	7.5801	-9.6399	1.0061	33.1416	9.983	0.523	0.000	0.000	0.000	0.000
31	I1	QI.52.I1	QI	QI.2.I1	QUAD	0.8874	0.0000	0.0000	24.2792	0.1300	19.0272	1.0535	1.0133	28.1171	-15.014	0.526	0.000	0.000	0.000	0.000
32	I1	BPM.53.I1	BPM	_	MONI	0.0000	0.0000	0.0000	24.2792	0.1300	19.0272	1.0535	1.0133	28.1171	-15.014	0.526	0.000	0.000	0.000	0.000
33	I1	CXI.53.I1	CXI	_	HKIC	0.0000	0.0000	0.0000	24.5292	0.1300	18.5074	1.0257	1.0154	36.1273	-17.027	0.527	0.000	0.000	0.000	0.000
34	I1	QI.53.I1	QI	QI.1.I1	QUAD	-0.8874	0.0000	0.0000	25.2042	0.1300	21.3134	-16.6763	1.0213	50.5808	25.903	0.530	0.000	0.000	0.000	0.000
35	I1	CYI.54.I1	CYI	_	YKIC	0.0000	0.0000	0.0000	25.3992	0.1300	28.3151	-19.2299	1.0226	40.9837	23.313	0.530	0.000	0.000	0.000	0.000
36	I1	OTR.54.I1	OTR	_	INSTR	0.0000	0.0000	0.0000	25.5392	0.1300	33.9561	-21.0632	1.0233	34.7165	21.453	0.531	0.000	0.000	0.000	0.000
37	I1	WS.54.I1	WS	_	MARK	0.0000	0.0000	0.0000	25.5642	0.1300	35.0175	-21.3906	1.0234	33.6522	21.121	0.531	0.000	0.000	0.000	0.000

INTRODUCTION | LONGLIST | POWERSUPPLIES | COMPONENTS | CHANGE HISTORY | GenParam

Names

- Unique Component Name
  Type and Serial number

- Unique Element (Position) Name
  Type.Position.Section (i.e. QI.57.I1)
  Position: round off longitudinal position of element

- Circuit Name (also used in optics program)
  Type.CircuitNr.Section (i.e. QI.5.I1)
  CircuitNr: count up within types in each section

Geometry View

position and orientation of element (mid point) in FLA coordinate system

Microsoft Excel

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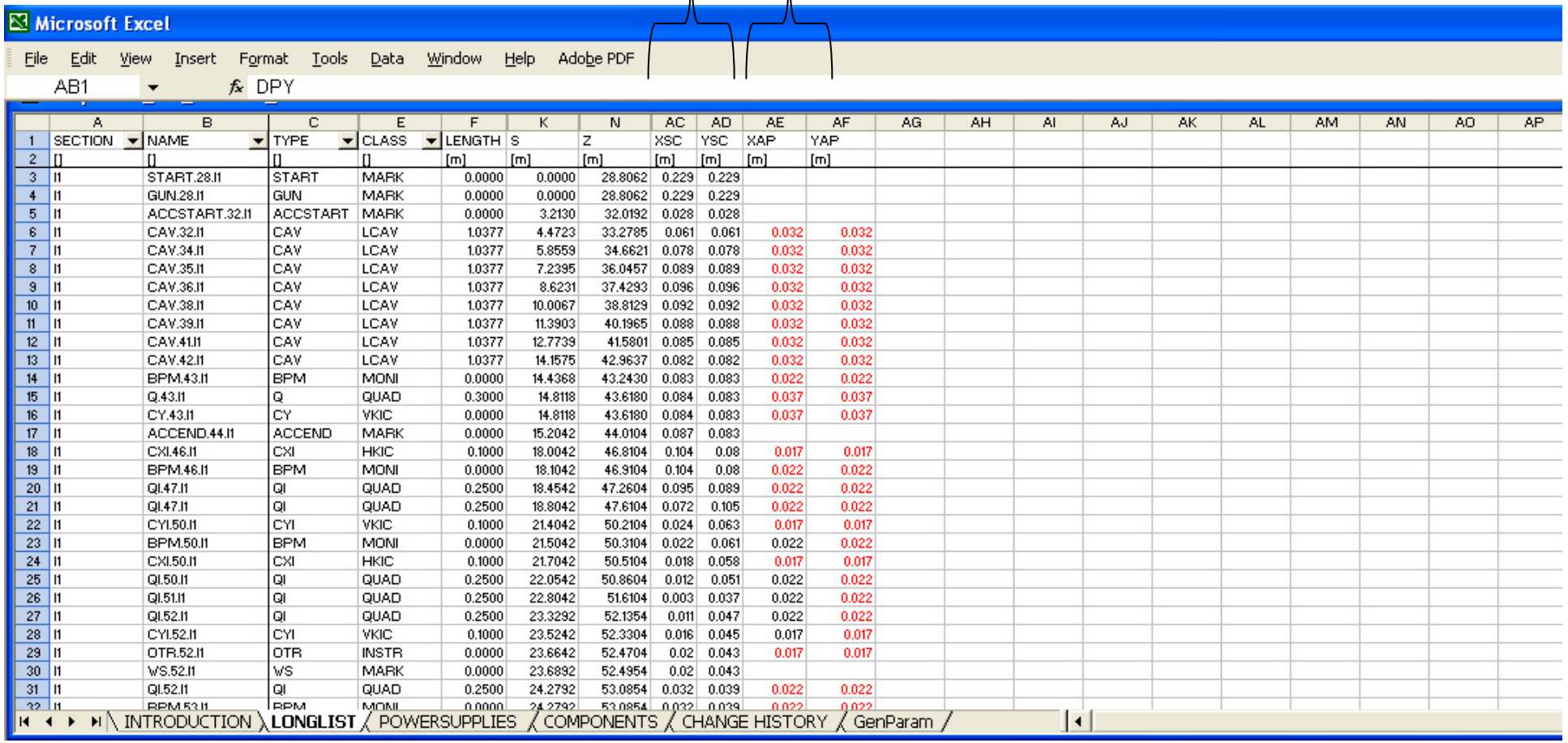
AN45

	A	B	C	E	F	J	K	L	M	N	O	P	Q	AG	AH	AI	AJ	AK	AL	AM	AN
1	SECTION	NAME	TYPE	CLASS	LENGTH	TILT	S	X	Y	Z	THETA	PHI	CHI								
2	[]	[]	[]	[]	[m]	[rad]	[m]	[m]	[m]	[m]	[rad]	[rad]	[rad]								
3	I1	START.28.I1	START	MARK	0.0000	0.0000	0.0000	0.0000	-2.7500	28.8062	0.0000	0.0000	0.0000								
4	I1	GUN.28.I1	GUN	MARK	0.0000	0.0000	0.0000	0.0000	-2.7500	28.8062	0.0000	0.0000	0.0000								
5	I1	ACCSTART.32.I1	ACCSTART	MARK	0.0000	0.0000	3.2130	0.0000	-2.7500	32.0192	0.0000	0.0000	0.0000								
6	I1	CAV.32.I1	CAV	LCAV	1.0377	0.0000	4.4723	0.0000	-2.7500	33.2785	0.0000	0.0000	0.0000								
7	I1	CAV.34.I1	CAV	LCAV	1.0377	0.0000	5.8559	0.0000	-2.7500	34.6621	0.0000	0.0000	0.0000								
8	I1	CAV.35.I1	CAV	LCAV	1.0377	0.0000	7.2395	0.0000	-2.7500	36.0457	0.0000	0.0000	0.0000								
9	I1	CAV.36.I1	CAV	LCAV	1.0377	0.0000	8.6231	0.0000	-2.7500	37.4293	0.0000	0.0000	0.0000								
10	I1	CAV.38.I1	CAV	LCAV	1.0377	0.0000	10.0067	0.0000	-2.7500	38.8129	0.0000	0.0000	0.0000								
11	I1	CAV.39.I1	CAV	LCAV	1.0377	0.0000	11.3903	0.0000	-2.7500	40.1965	0.0000	0.0000	0.0000								
12	I1	CAV.41.I1	CAV	LCAV	1.0377	0.0000	12.7739	0.0000	-2.7500	41.5801	0.0000	0.0000	0.0000								
13	I1	CAV.42.I1	CAV	LCAV	1.0377	0.0000	14.1575	0.0000	-2.7500	42.9637	0.0000	0.0000	0.0000								
14	I1	BPM.43.I1	BPM	MONI	0.0000	0.0000	14.4368	0.0000	-2.7500	43.2430	0.0000	0.0000	0.0000								
15	I1	Q.43.I1	Q	QUAD	0.3000	0.0000	14.8118	0.0000	-2.7500	43.6180	0.0000	0.0000	0.0000								
16	I1	CY.43.I1	CY	YKIC	0.0000	0.0000	14.8118	0.0000	-2.7500	43.6180	0.0000	0.0000	0.0000								
17	I1	ACCEND.44.I1	ACCEND	MARK	0.0000	0.0000	15.2042	0.0000	-2.7500	44.0104	0.0000	0.0000	0.0000								
18	I1	CXI.46.I1	CXI	HKIC	0.1000	0.0000	18.0042	0.0000	-2.7500	46.8104	0.0000	0.0000	0.0000								
19	I1	BPM.46.I1	BPM	MONI	0.0000	0.0000	18.1042	0.0000	-2.7500	46.9104	0.0000	0.0000	0.0000								
20	I1	QI.47.I1	QI	QUAD	0.2500	0.0000	18.4542	0.0000	-2.7500	47.2604	0.0000	0.0000	0.0000								
21	I1	QI.47.I1	QI	QUAD	0.2500	0.0000	18.8042	0.0000	-2.7500	47.6104	0.0000	0.0000	0.0000								
22	I1	CYI.50.I1	CYI	YKIC	0.1000	0.0000	21.4042	0.0000	-2.7500	50.2104	0.0000	0.0000	0.0000								
23	I1	BPM.50.I1	BPM	MONI	0.0000	0.0000	21.5042	0.0000	-2.7500	50.3104	0.0000	0.0000	0.0000								
24	I1	CXI.50.I1	CXI	HKIC	0.1000	0.0000	21.7042	0.0000	-2.7500	50.5104	0.0000	0.0000	0.0000								
25	I1	QI.50.I1	QI	QUAD	0.2500	0.0000	22.0542	0.0000	-2.7500	50.8604	0.0000	0.0000	0.0000								
26	I1	QI.51.I1	QI	QUAD	0.2500	0.0000	22.8042	0.0000	-2.7500	51.6104	0.0000	0.0000	0.0000								
27	I1	QI.52.I1	QI	QUAD	0.2500	0.0000	23.3292	0.0000	-2.7500	52.1354	0.0000	0.0000	0.0000								
28	I1	CYI.52.I1	CYI	YKIC	0.1000	0.0000	23.5242	0.0000	-2.7500	52.3304	0.0000	0.0000	0.0000								
29	I1	OTR.52.I1	OTR	INSTR	0.0000	0.0000	23.6642	0.0000	-2.7500	52.4704	0.0000	0.0000	0.0000								
30	I1	WS.52.I1	WS	MARK	0.0000	0.0000	23.6892	0.0000	-2.7500	52.4954	0.0000	0.0000	0.0000								
31	I1	QI.52.I1	QI	QUAD	0.2500	0.0000	24.2792	0.0000	-2.7500	53.0854	0.0000	0.0000	0.0000								
32	I1	BPM.53.I1	BPM	MONI	0.0000	0.0000	24.2792	0.0000	-2.7500	53.0854	0.0000	0.0000	0.0000								
33	I1	CXI.53.I1	CXI	HKIC	0.1000	0.0000	24.5292	0.0000	-2.7500	53.3354	0.0000	0.0000	0.0000								
34	I1	QI.53.I1	QI	QUAD	0.2500	0.0000	25.2042	0.0000	-2.7500	54.0104	0.0000	0.0000	0.0000								
35	I1	CYI.54.I1	CYI	YKIC	0.1000	0.0000	25.3992	0.0000	-2.7500	54.2054	0.0000	0.0000	0.0000								
36	I1	OTR.54.I1	OTR	INSTR	0.0000	0.0000	25.5392	0.0000	-2.7500	54.3454	0.0000	0.0000	0.0000								
37	I1	WS.54.I1	WS	MARK	0.0000	0.0000	25.5642	0.0000	-2.7500	54.3704	0.0000	0.0000	0.0000								
38	I1	QI.54.I1	QI	QUAD	0.2500	0.0000	26.1542	0.0000	-2.7500	54.9604	0.0000	0.0000	0.0000								
39	I1	BPM.54.I1	BPM	MONI	0.0000	0.0000	26.1542	0.0000	-2.7500	54.9604	0.0000	0.0000	0.0000								

Aperture View

beam stay clear (100 σ, δ=3%) inner aperture (where defined)



Microsoft Excel

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AB1 fx DPY

	A	B	C	E	F	K	N	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
1	SECTION	NAME	TYPE	CLASS	LENGTH	S	Z	XSC	YSC	XAP	YAP										
2	[]	[]	[]	[]	[m]	[m]	[m]	[m]	[m]	[m]	[m]										
3	I1	START.28.I1	START	MARK	0.0000	0.0000	28.8062	0.229	0.229												
4	I1	GUN.28.I1	GUN	MARK	0.0000	0.0000	28.8062	0.229	0.229												
5	I1	ACCSTART.32.I1	ACCSTART	MARK	0.0000	3.2130	32.0192	0.028	0.028												
6	I1	CAV.32.I1	CAV	LCAV	1.0377	4.4723	33.2785	0.061	0.061	0.032	0.032										
7	I1	CAV.34.I1	CAV	LCAV	1.0377	5.8559	34.6621	0.078	0.078	0.032	0.032										
8	I1	CAV.35.I1	CAV	LCAV	1.0377	7.2395	36.0457	0.089	0.089	0.032	0.032										
9	I1	CAV.36.I1	CAV	LCAV	1.0377	8.6231	37.4293	0.096	0.096	0.032	0.032										
10	I1	CAV.38.I1	CAV	LCAV	1.0377	10.0067	38.8129	0.092	0.092	0.032	0.032										
11	I1	CAV.39.I1	CAV	LCAV	1.0377	11.3903	40.1965	0.088	0.088	0.032	0.032										
12	I1	CAV.41.I1	CAV	LCAV	1.0377	12.7739	41.5801	0.085	0.085	0.032	0.032										
13	I1	CAV.42.I1	CAV	LCAV	1.0377	14.1575	42.9637	0.082	0.082	0.032	0.032										
14	I1	BPM.43.I1	BPM	MONI	0.0000	14.4368	43.2430	0.083	0.083	0.022	0.022										
15	I1	Q.43.I1	Q	QUAD	0.3000	14.8118	43.6180	0.084	0.083	0.037	0.037										
16	I1	CY.43.I1	CY	YKIC	0.0000	14.8118	43.6180	0.084	0.083	0.037	0.037										
17	I1	ACCEND.44.I1	ACCEND	MARK	0.0000	15.2042	44.0104	0.087	0.083												
18	I1	CXI.46.I1	CXI	HKIC	0.1000	18.0042	46.8104	0.104	0.08	0.017	0.017										
19	I1	BPM.46.I1	BPM	MONI	0.0000	18.1042	46.9104	0.104	0.08	0.022	0.022										
20	I1	QI.47.I1	QI	QUAD	0.2500	18.4542	47.2604	0.095	0.089	0.022	0.022										
21	I1	QI.47.I1	QI	QUAD	0.2500	18.8042	47.6104	0.072	0.105	0.022	0.022										
22	I1	CYI.50.I1	CYI	YKIC	0.1000	21.4042	50.2104	0.024	0.063	0.017	0.017										
23	I1	BPM.50.I1	BPM	MONI	0.0000	21.5042	50.3104	0.022	0.061	0.022	0.022										
24	I1	CXI.50.I1	CXI	HKIC	0.1000	21.7042	50.5104	0.018	0.058	0.017	0.017										
25	I1	QI.50.I1	QI	QUAD	0.2500	22.0542	50.8604	0.012	0.051	0.022	0.022										
26	I1	QI.51.I1	QI	QUAD	0.2500	22.8042	51.6104	0.003	0.037	0.022	0.022										
27	I1	QI.52.I1	QI	QUAD	0.2500	23.3292	52.1354	0.011	0.047	0.022	0.022										
28	I1	CYI.52.I1	CYI	YKIC	0.1000	23.5242	52.3304	0.016	0.045	0.017	0.017										
29	I1	OTR.52.I1	OTR	INSTR	0.0000	23.6642	52.4704	0.02	0.043	0.017	0.017										
30	I1	WS.52.I1	WS	MARK	0.0000	23.6892	52.4954	0.02	0.043												
31	I1	QI.52.I1	QI	QUAD	0.2500	24.2792	53.0854	0.032	0.039	0.022	0.022										
32	I1	BPM.53.I1	BPM	MONI	0.0000	24.2792	53.0854	0.032	0.039	0.022	0.022										

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Power Supplies

nominal: data at 17.5 GeV (system laid out for max. 25 GeV)
max: all PS at maximum power (i.e. 25 GeV + max. gradient at all PS)

(max. dist. to hall + 50)*2 from components from MKK

Microsoft Excel

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1	CTION	PE	KCUIT	ASS	#_OF_MAGNETS	STRENGTH	z	DIST_TO_HALL	ENOM		Cable Length		LENGTH	EMAX	IMAX	YMAX	GMAX	Cable Cross Section		GNOM	GEMAX	IMOM		NominalCable Voltage	NominalTotal Voltage	NominalPower		Max Cable Voltage	Max Total Voltage	Total Power
2						[m^(n-1)]	[m]	[m]	[GeV]		[m]		[m]	[GeV]	[A]	[V]	[m^(-n+1)]	[mm^2]		[m^(-n+1)]	[m^(-n+1)]	[A]		[V]	[V]	[kW]		[V]	[V]	[kW]
9	I1	QI	QI.6.I1	QUAD	1	1.56	51.49	51.49	0.13		202.97		0.2	0.15	61	2	5.00	50.00		3.39	3.91	41.28		2.99	4.35	0.18		4.42	6.42	0.39
10	I1	QI	QI.1.I1	QUAD	4	-0.89	52.01	57.64	0.13		215.27		0.2	0.15	61	2	5.00	50.00		1.92	2.22	23.46		1.80	4.88	0.11		4.69	12.69	0.77
11	I1	QI	QI.2.I1	QUAD	3	0.89	52.96	56.71	0.13		213.42		0.2	0.15	61	2	5.00	50.00		1.92	2.22	23.46		1.79	4.10	0.10		4.65	10.65	0.65
12	I1	QI	QI.7.I1	QUAD	1	0.59	58.99	58.99	0.13		217.97		0.2	0.15	61	2	5.00	50.00		1.27	1.47	15.49		1.21	1.71	0.03		4.75	6.75	0.41
13	I1	QI	QI.8.I1	QUAD	1	0.42	59.74	59.74	0.13		219.47		0.2	0.15	61	2	5.00	50.00		0.91	1.05	11.08		0.87	1.23	0.01		4.78	6.78	0.41
14	I1	QI	QI.9.I1	QUAD	1	-0.49	63.49	63.49	0.13		226.97		0.2	0.15	61	2	5.00	50.00		1.06	1.22	12.89		1.04	1.47	0.02		4.94	6.94	0.42
15	I1	QI	QI.10.I1	QUAD	1	0.49	64.74	64.74	0.13		229.47		0.2	0.15	61	2	5.00	50.00		1.05	1.22	12.84		1.05	1.47	0.02		5.00	7.00	0.43
16	I1	QI	QI.11.I1	QUAD	1	-0.52	70.49	70.49	0.13		240.97		0.2	0.15	61	2	5.00	50.00		1.14	1.31	13.85		1.19	1.65	0.02		5.25	7.25	0.44
17	I1	QI	QI.12.I1	QUAD	1	0.49	71.74	71.74	0.13		243.47		0.2	0.15	61	2	5.00	50.00		1.05	1.22	12.85		1.12	1.54	0.02		5.30	7.30	0.45
18	I1	QI	QI.13.I1	QUAD	2	-0.90	74.88	79.18	0.13		258.36		0.2	0.15	61	2	5.00	50.00		1.95	2.25	23.73		2.19	3.75	0.09		5.63	9.63	0.59
19	I1	QI	QI.14.I1	QUAD	1	0.49	77.03	77.03	0.13		254.06		0.2	0.15	61	2	5.00	50.00		1.07	1.23	13.02		1.18	1.61	0.02		5.53	7.53	0.46
20	I1	QI	QI.17.I1	QUAD	1	0.69	82.33	82.33	0.13		264.65		0.2	0.15	61	2	5.00	50.00		1.50	1.73	18.25		1.72	2.32	0.04		5.77	7.77	0.47
21	I1	QI	QI.18.I1	QUAD	1	-0.68	83.58	83.58	0.13		267.15		0.2	0.15	61	2	5.00	50.00		1.47	1.70	17.96		1.71	2.30	0.04		5.82	7.82	0.48
22	I1	QI	QI.19.I1	QUAD	1	0.53	90.43	90.43	0.13		280.85		0.2	0.15	61	2	5.00	50.00		1.14	1.31	13.88		1.39	1.85	0.03		6.12	8.12	0.50
23	I1	QI	QI.20.I1	QUAD	1	-0.51	91.68	91.68	0.13		283.35		0.2	0.15	61	2	5.00	50.00		1.11	1.28	13.56		1.37	1.82	0.02		6.17	8.17	0.50
24	L1	Q	Q.1.L1	QUAD	1	0.05	106.00	106.00	0.25		312.00		0.1665	25	50	0.1	35.00	50.00		0.25	25.45	0.36		0.04	0.04	0.00		5.57	5.67	0.28
25	L1	Q	Q.2.L1	QUAD	1	-0.10	117.99	117.99	0.36		335.98		0.1665	25	50	0.1	35.00	50.00		0.75	51.57	1.08		0.13	0.13	0.00		6.00	6.10	0.30
26	L1	Q	Q.3.L1	QUAD	1	0.11	129.98	129.98	0.48		359.96		0.1665	25	50	0.1	35.00	50.00		1.06	55.05	1.52		0.20	0.20	0.00		6.43	6.53	0.33
27	L1	Q	Q.4.L1	QUAD	1	-0.14	141.97	141.97	0.60		383.94		0.1665	25	50	0.1	35.00	50.00		1.73	72.09	2.47		0.34	0.34	0.00		6.86	6.96	0.35
28	L1	Q3	Q3.1.L1	QUAD	1	0.05	153.96	153.96	0.55		407.93		0.1665	25	50	0.1	35.00	50.00		0.55	24.92	0.78		0.11	0.12	0.00		7.28	7.38	0.37
29	L1	Q3	Q3.2.L1	QUAD	1	-0.07	165.96	165.96	0.50		431.91		0.1665	25	50	0.1	35.00	50.00		0.70	35.21	1.01		0.16	0.16	0.00		7.71	7.81	0.39
30	B1	BA	BA.1.B1	SBEN	4	0.07	176.49	198.49	0.50		496.97		0.3	0.8	473	5.4	0.67	240.00		0.41	0.66	292.38		10.81	24.16	7.06		17.49	39.09	18.49
31	B1	QC	QC.1.B1	QUAD	1	0.02	170.79	170.79	0.50		441.57		0.2	0.8	120	4.2	10.01	50.00		0.17	0.28	2.08		0.33	0.40	0.00		18.92	23.12	2.77
32	B1	QC	QC.2.B1	QUAD	1	0.17	171.89	171.89	0.50		443.77		0.2	0.8	120	4.2	10.01	50.00		1.44	2.30	17.24		2.73	3.34	0.06		19.02	23.22	2.79
33	B1	QC	QC.3.B1	QUAD	1	-0.23	174.14	174.14	0.50		448.27		0.2	0.8	120	4.2	10.01	50.00		1.93	3.08	23.11		3.70	4.51	0.10		19.21	23.41	2.81
34	B1	QC	QC.4.B1	QUAD	1	0.06	175.24	175.24	0.50		450.47		0.2	0.8	120	4.2	10.01	50.00		0.49	0.79	5.92		0.95	1.16	0.01		19.31	23.51	2.82
35	B1	QC	QC.5.B1	QUAD	1	-0.29	200.79	200.79	0.50		501.57		0.2	0.8	120	4.2	10.01	50.00		2.45	3.92	29.41		5.27	6.30	0.19		21.50	25.70	3.08
36	B1	QC	QC.6.B1	QUAD	1	0.22	202.69	202.69	0.50		505.37		0.2	0.8	120	4.2	10.01	50.00		1.86	2.98	22.32		4.03	4.81	0.11		21.66	25.86	3.10
37	B1	QC	QC.7.B1	QUAD	1	0.32	204.59	204.59	0.50		509.17		0.2	0.8	120	4.2	10.01	50.00		2.69	4.31	32.31		5.87	7.01	0.23		21.82	26.02	3.12
38	B1	QC	QC.8.B1	QUAD	1	-0.34	205.79	205.79	0.50		511.57		0.2	0.8	120	4.2	10.01	50.00		2.87	4.60	34.46		6.30	7.50	0.26		21.92	26.12	3.13
39	B1	QC	QC.9.B1	QUAD	1	-0.15	206.99	206.99	0.50		513.97		0.2	0.8	120	4.2	10.01	50.00		1.22	1.95	14.65		2.69	3.20	0.05		22.03	26.23	3.15
40	B1	QC	QC.10.B1	QUAD	1	0.13	208.89	208.89	0.50		517.77		0.2	0.8	120	4.2	10.01	50.00		1.09	1.74	13.06		2.41	2.87	0.04		22.19	26.39	3.17
41	B1	QC	QC.11.B1	QUAD	1	-0.40	210.79	210.79	0.50		521.57		0.2	0.8	120	4.2	10.01	50.00		3.37	5.39	40.42		7.53	8.94	0.36		22.35	26.55	3.19
42	B1	QC	QC.12.B1	QUAD	2	0.45	212.69	216.49	0.50		532.97		0.2	0.8	120	4.2	10.01	50.00		3.76	6.01	45.05		8.57	11.73	0.53		22.84	31.24	3.75
43	B1	QC	QC.13.B1	QUAD	2	-0.62	214.59	218.39	0.50		536.77		0.2	0.8	120	4.2	10.01	50.00		5.14	8.23	61.66		11.82	16.14	1.00		23.00	31.40	3.77
44	B1	QC	QC.14.B1	QUAD	1	-0.03	220.29	220.29	0.50		540.57		0.2	0.8	120	4.2	10.01	50.00		0.24	0.38	2.88		0.56	0.66	0.00		23.17	27.37	3.28

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Components

from longlist

from MEA, MDI, …

Microsoft Excel

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1		Type		Count	KnL	Yoke Length	Halfgap or Boreradius	Emin	Emax	Gmax	Bpole	Maximum Current	Winding	Voltage Drop	Power Loss	Weight	Height (perpendicular to bend plane)	Width (in bend plane)	Total Length	Cable Cross Section	Comment
2					[m^n-1]	[m]	[m]	[GeV]	[GeV]	[T/m^n-1]	[T]	[A]	#	[V]	[KW]	[Kg]	[m]	[m]	[m]	[mm^2]	
3																					
25	Correctio	CXE	1	52	7.20E-05	0.2	0.025	6	25	0.03002	0.03002	9.9	402	5	0.05	50	0.16	0.254	0.288		BEAM DISTRIBUTION
26		CYE	1	51	7.20E-05	0.2	0.025	6	25	0.03002	0.03002	19.9	402	5	0.05	50	0.16	0.254	0.288		BEAM DISTRIBUTION
27		CXF	1	35	1.80E-04	0.2	0.025	6	25	0.07505	0.07505	5	402	5	0.05	50	0.16	0.254	0.288		BEAM DISTRIBUTION
28		CYF	1	33	1.80E-04	0.2	0.025	6	25	0.07505	0.07505	5	402	5	0.05	50	0.16	0.254	0.288		BEAM DISTRIBUTION
29		CXG	1	0	3.60E-04	0.2	0.050	6	25	0.1501	0.1501	9.5	1400	25	0.25	190	0.3	0.46	0.38		BEAM DUMP
30		CYG	1	0	3.60E-04	0.2	0.050	6	25	0.1501	0.1501	9.5	1400	25	0.25	190	0.3	0.46	0.38		BEAM DUMP
31		CX	1	59		0.1975	0.040	0.13	25	0.04	0.04	50	33	0.1	0.001	10	0.05	0.05	0.23		COLD CORRECTOR IN MODU
32		CY	1	60		0.1975	0.040	0.13	25	0.04	0.04	50	33	0.1	0.001	10	0.05	0.05	0.23		COLD CORRECTOR IN MODU
33				603																	
34																					
35	Dipoles	BA	1	4	7.50E-02	0.3	0.020	0.1	0.8	0.667111	0.67	473	24	5.4	2.6	260	0.27	0.46	0.52	240	BUNCH COMPRESSOR 1 CHI
36		BI	1	3	3.14E-01	0.5	0.020	0.1	0.15	0.314209	0.31	668	8	2.9	1.9	280	0.21	0.386	0.72	370	INJECTOR DOGLEG AND DU
37		BF	1	1	3.49E-01	1	0.020	0.1	0.8	0.931464	0.93	440	36	20	8.8	1800	0.42	0.644	1.23	240	BUNCH COMPRESSOR 1 DU
38		BG	1	1	3.49E-01	2.5	0.020	0.5	3	1.397195	1.40	661	36	60	39.9	4500	0.42	0.644	2.72	370	BUNCH COMPRESSOR 2 DU
39		BB	1	4	3.80E-02	0.3	0.020	0.5	3	1.267512	1.27	900	24	10	9.2	450	0.35	0.54	0.52	370	BUNCH COMPRESSOR 2 CHI
40		BC	1	8	1.00E-02	2.5	0.025	6	25	0.333556	0.33	112	20	7	0.8	5550	0.3	0.6	0.522	25	COLLIMATION DOGLEG
41		BJ	1	8	1.00E-03	0.5	0.025	6	25	0.166778	0.17	112	20	2	0.2	1550	0.3	0.6	0.522	25	COLLIMATION DOGLEG SHO
42		BE	1	6	2.19E-02	2.5	0.025	6	25	0.730487	0.73	444	42	34	15.4	8450	0.57	0.874	2.8	185	BEAM DISTRIBUTION XS2&3
43		BD	1	14	8.00E-03	1	0.025	6	25	0.667111	0.67	532	20	9	5	1050	0.36	0.6	1.22	185	BEAM DISTRIBUTION XS1
44		BV	1	14	4.38E-02	2.5	0.025	6	25	1.460974	1.46	887	42	80	71	8450	0.57	0.874	2.78	480	BEAM DUMP0&1&2
45		BZ	1		5.00E-03	1	0.025	6	25	0.416945	0.42	155	120	32	5	560	0.19	0.332	1.22	185	BEAM DISTRIBUTION XS1 Lan
46		BY	1	4	5.00E-03	1	0.025	6	25	0.416945	0.42	21600	1	1.13	24	220	0.36	0.6	1.2	2000	BEAM DISTRIBUTION XS1 SE
47		BX	1	12	2.30E-03	0.5	0.050	6	25	0.383589	0.38	681	24	15.9	11	500	0.68	0.35	0.733	370	DIAGNOSTIC WIGGLER BEAM
48		SWEEP	1	3	1.00E-02	1	0.050	6	25	0.833889	0.83	440	36	20	8.8	1800				240	Beam Dump Sweeper
49		BSEC	1	6	2.40E-02	2	0.020	6	25	1.000667	1.00										Permanent Magnet Dipole for s
50		PB	1	0	4.68E-02	5.31	0.035	6	25	0.735	0.74	3600	64	12.24	44	7900	0.454	0.615	5.608		PETRA B
51				82																	
52																					
53	Multipoles	SA	3	30	1.00E+01	0.4	0.025	6	25	1200	0.375	225	21	20	10	400	0.42	0.48	0.51	240	COLLIMATION
54		SB	3	6	1.00E+01	1	0.025	6	25	1200	0.375	445	21	46.2	20.6	400	0.42	0.48	0.51	240	COLLIMATION, XS1-4
55				36																	
56																					
57		CXFB	1	2	1.00E+01	0.5	0.025	6	25												Feedback Kicker
58		CYFB	1	2	1.00E+01	0.5	0.025	6	25												Feedback Kicker
59	Kickers	FK	1	48	1.00E+01	0.5	0.025	6	25												Beam Distribution Kicker
60		VK	1	2			0.020														Diagnostic Kicker
61		HK	1	0			0.020														
62																					
63																					
64	Undulator	UNDU	1	117		5.00E+00	0.006														Undulator
65		BPS	1	107		2.00E-01	0.006														Phase Shifter
66																					
67		CAV		936			0.035														

Database Outlook

Implementation of data/components which are not directly optics relevant (but beam dynamics relevant, for instance impedance budget)

- Example: Pumps, bellows, flanges of BC section

- single point of information during design (construction, commissioning, operation) phase of specification, properties, status, location of (beam line) components
- facilitates interactive design procedure ?

Database Features (Wish List)

- Change of parameters by individual responsible should be possible
- Frequent consistency check
- Local copy (Excel List) for day to day work