RTML EDR Magnets

Overview

JCT

RTML Magnet Work Packages
(N. Solyak, 071016)

- **Magnets and PS**
  - 6.1 Design, specify & optimize DC conventional magnets
    - Optimize number of types and apertures
    - Design warm quads, bends and correctors
    - Design and prototype BC wiggler wide aperture magnet
    - Design, prototype quad/corrector for return line
    - Design tune-up Septa and PS
  - 6.2 Design and Specify pulsed magnets
    - Design tune-up extraction kickers and pulsers
    - Design feed-back, feed-forward correctors and PS
  - 6.3 Design/prototype SC quad/corrector for BC1/BC2
  - 6.4 Design, specify SC solenoid
  - 6.5 Optimize PS and cabling
  - 6.6 Design, specify DC PS
  - 6.7 Design stable supports for magnets

Brief Introduction

- RTML has changed with the move of the DR's to the IR location
- PT & Vladimir had iterated (through August) to reduce the number of magnet styles:

RTML Magnet Families - August 2007				
SECTOR BENDS	QUADS	DC CORRECTORS	FEED-FORWARD CORRECTORS	SOLENOIDS
D25L100	Q20L100	D20L50	D20LXXX	SLSC50L2600
D25L900V1	Q50L100	DSC75L200		
D25L900V2	Q20L200			
D25L900V3	Q60L200			
D25L1600	QSC75L200			
D25L2300				
Number of Families				15
TOTAL MAGNETS:				4576

- Further work & review…

Key elements

- Long transfer line from DR
  - Quads and trim dipoles
  - Stability & stray fields
- Superconducting solenoids in the Bunch Compressor
  - Magnet, cryostat, etc. – design needed
- Superconducting quads
  - Optimized for lower energy than ML
- Pulsed magnets
  - Preliminary system designs needed

Key Elements, cont

- Power Systems
  - Iteration w/ more detailed magnet parameters
  - Optimization of I, V for cables, PS, & magnets
    - LCW loads
    - Magnet size and cost
  - Stringing rules
    - Review which magnets need individual PS
- Vacuum System & Magnet Stands
  - Details need to be developed
  - Beam Line physical layouts for interfaces & interferences
  - Installation of beam tubes in situ

RTML EDR Magnet Design Estimate

from RDR - April 2007

Magnet Engineering Name (Style)	No. of Magnets	Design Hours		
		Sci/Eng Hrs	Dsg/Drft Hrs	Admin Hrs
Rings to Main Linac Magnets				
RTML Conventional Magnets				
D20L100	1992	196	733	23
D20L100V1	6	438	1,320	44
D20L100V3	6	438	1,320	44
D25L400	184	196	733	23
D25L800	232	438	1,320	44
D25L900V1	144	438	1,320	44
D25L900V2	144	438	1,320	44
D60L1000	4	438	1,320	44
D60L2000	8	438	1,320	44
Q20L100	818	196	733	23
Q20L200	484	196	733	23
Q50L50	28	196	733	23
Q60L100	16	196	733	23
Q60L1000	18	196	733	23
Q60L200	32	196	733	23
RTML SC Magnets				
DSC75L100	84	828	2,371	65
QSC75L200	56	828	2,371	65
SL20L2600	8	2,483	7,113	196
RTML Magnet Total	4,264	8,773	26,960	821

Note:
Estimate does not include pulsed magnets (discussed by T. Mattison)

Discussion

- Magnets – Vladimir Kashikhin
- Magnetic Field Stability Measurements – Joe DiMarco
- Pulsed Magnets – Tom Mattison
- Power Systems – Paul Bellomo