



# FIELD QUALITY UPDATE

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# TRIPLET HEADS



- Table version 4 – May 2015 [S. Bermudez, FNAL meeting May 2015]
  - For the first time we separate the coil heads
  - We give a length of the straight part and of the heads
  - All normalized to the nominal gradient
  - For the first time we see the difference between Q1/Q3 and Q2
    - About 0.15 units of  $b_6$  at high field

Triplet field quality version 4 - May 20 2015 - $R_{ref}=50$ mm																
Straight part											Ends		Integral			
Normal	Systematic				Uncertainty				Random		Conn. Side	Non conn. Side	Q1/Q3		Q2a/b	
	Geometric	Ass. & cool	Saturation	Persistent	Injection	High Field	Injection	High Field	Injection	High Field			Injection	High Field	Injection	High Field
2									10	10						
3	0.000	0.000	0.000	0.000	0.000	0.000	0.820	0.820	0.820	0.820			0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.570	0.570	0.570	0.570			0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.000	0.420	0.420	0.420	0.420			0.000	0.000	0.000	0.000
6	-2.200	0.900	0.660	-20.000	-21.300	-0.640	1.100	1.100	1.100	1.100	8.943	-0.025	-16.692	0.323	-18.593	-0.075
7	0.000	0.000	0.000	0.000	0.000	0.000	0.190	0.190	0.190	0.190			0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000	0.000	0.130	0.130	0.130	0.130			0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000	0.000	0.070	0.070	0.070	0.070			0.000	0.000	0.000	0.000
10	-0.110	0.000	0.000	4.000	3.890	-0.110	0.200	0.200	0.200	0.200	-0.189	-0.821	3.119	-0.175	3.437	-0.148
11	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.026	0.026	0.026			0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.018	0.018	0.018			0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.009	0.009	0.009			0.000	0.000	0.000	0.000
14	-0.790	0.000	-0.080	1.000	0.210	-0.870	0.023	0.023	0.023	0.023	-0.545	-1.083	0.033	-0.856	0.106	-0.862
Magnetic length straight part							Q1/Q3	3.459	Q2a/b	6.409	Mag. Len. Ends		0.400	0.341		



# TRIPLET HEADS



- Table version 4 – May 2015

- We also have the second cross-section

- Minor differences
    - $b_{10}$  reduced from -0.39 to -0.15/-0.18
    - $b_6$  reduced from -0.40 to -0.32/-0.07 (but the spread is much larger so no change)
    - $b_{14}$  increased from -0.67 to -0.86

Triplet field quality version 4 - May 20 2015 - $R_{ref}=50$ mm																
Straight part											Ends		Integral			
Normal	Systematic				Uncertainty				Random		Conn. Side	Non conn. Side	Q1/Q3		Q2a/b	
	Geometric	Ass. & cool	Saturation	Persistent	Injection	High Field	Injection	High Field	Injection	High Field			Injection	High Field	Injection	High Field
2									10	10						
3	0.000	0.000	0.000	0.000	0.000	0.000	0.820	0.820	0.820	0.820			0.000	0.000	0.000	0.000
4	0.000	0.000	0.000	0.000	0.000	0.000	0.570	0.570	0.570	0.570			0.000	0.000	0.000	0.000
5	0.000	0.000	0.000	0.000	0.000	0.000	0.420	0.420	0.420	0.420			0.000	0.000	0.000	0.000
6	-2.200	0.900	0.660	-20.000	-21.300	-0.640	1.100	1.100	1.100	1.100	8.943	-0.025	-16.692	0.323	-18.593	-0.075
7	0.000	0.000	0.000	0.000	0.000	0.000	0.190	0.190	0.190	0.190			0.000	0.000	0.000	0.000
8	0.000	0.000	0.000	0.000	0.000	0.000	0.130	0.130	0.130	0.130			0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000	0.000	0.070	0.070	0.070	0.070			0.000	0.000	0.000	0.000
10	-0.110	0.000	0.000	4.000	3.890	-0.110	0.200	0.200	0.200	0.200	-0.189	-0.821	3.119	-0.175	3.437	-0.148
11	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.026	0.026	0.026			0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.018	0.018	0.018			0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.009	0.009	0.009			0.000	0.000	0.000	0.000
14	-0.790	0.000	-0.080	1.000	0.210	-0.870	0.023	0.023	0.023	0.023	-0.545	-1.083	0.033	-0.856	0.106	-0.862
Magnetic length straight part							Q1/Q3	3.459	Q2a/b	6.409	Mag. Len. Ends		0.400	0.341		



# TRIPLET HEADS



- Table version 4 – May 2015
  - We have for the first time systematic skew due to head
  - A few units  $a_2$
  - 0.1-0.2 units of  $a_6$

<i>Triplet field quality version 4 - May 20 2015 - <math>R_{ref}=50</math> mm</i>																
Straight part										Ends		Integral				
Systematic				Uncertainty		Random				Q1/Q3		Q2a/b				
Geometric	Ass. & cool	Saturation	Persistent	Injection	High Field	Injection	High Field	Injection	High Field	Conn.	Side Non conn.	Injection	High Field	Injection	High Field	
Skew																
2								10.000	10.000	-31.342		-2.985	-2.985	-1.753	-1.753	
3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.650	0.650	0.650	0.650	0.000	0.000	0.000	0.000	
4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.650	0.650	0.650	0.650	0.000	0.000	0.000	0.000	
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.430	0.430	0.430	0.430	0.000	0.000	0.000	0.000	
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.310	0.310	0.310	0.310	2.209	0.210	0.210	0.124	0.124
7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.190	0.190	0.190	0.190	0.000	0.000	0.000	0.000	
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110	0.110	0.110	0.110	0.000	0.000	0.000	0.000	
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.080	0.080	0.080	0.000	0.000	0.000	0.000	
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.040	0.040	0.040	0.065	0.006	0.006	0.004	0.004
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.026	0.026	0.026	0.000	0.000	0.000	0.000	
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.014	0.014	0.014	0.000	0.000	0.000	0.000	
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.010	0.010	0.010	0.000	0.000	0.000	0.000	
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.005	0.005	0.005	-0.222	-0.021	-0.021	-0.012	-0.012
Magnetic length straight part				Q1/Q3	3.459	Q2a/b	6.409	Mag. Len. Ends		0.400	0.341					
Magnetic length straight part				Q1/Q3	3.459	Q2a/b	6.409	Mag. Len. Ends		0.400	0.341					



# FUTURE WORK



- If format ok for WP2, we will extend to D1 and D2 in a few weeks
- Some concern about multipoles ranging from order 5 to order 7 [J. Di Marco, FNAL meeting May 2015]
  - Much higher than expected in HQ