

May 1, 1996

EXPECTED_D18.TABLE5_f

Table 5(f)

Expected values of body harmonics in 180 mm aperture dipoles (DX)
for insertion region at the top energy (6659 A, 4.28 T) :

***** Reference Radius is 60 mm *****

[<bn> = mean, d(bn) = uncertainty in mean, sig(bn) = sigma for bn]

n	<bn>	d(bn)	sig(bn)	<an>	d(an)	sig(an)
1	0.	0.4	0.5	-2.5	1.3	0.9
2	-0.6	4	1.6	0	0.4	0.3
3	0.	0.2	.2	0	0.3	0.7
4	0.0	1	.4	0	.06	.13
5	0	.03	.1	0	0.1	.17
6	0.05	.2	.1	0	.03	.1
7	0	.03	.1	0	.03	.1
8	-0.08	.1	.1	0	.03	.1
9	0.0	.03	.1	0	.03	.1
10	-0.04	0.05	.1	0	.03	.1
11	0.0	0.01	.05	0	0.01	0.05
12	-0.07	0.05	.05	0	0.01	0.05

Expected values of body harmonics at Injection Amp
(same as above except for the following harmonics)

1				0.0	1.	1.3
2	-4.0	4.	1.6			
4	-.4	1.	0.4			
6	-0.6	.1	0.2			

Expected values of body harmonics at the transition
(same as above except for the following harmonics)

1				0.0	1.	1.3
2	-3.0	4	2.3			
4	-0.3	1.5	0.4			
6	-0.6	0.5	0.2			

Expected values of harmonics in LEAD END at ALL current (Unit-m)

n	<Bn>	d(Bn)	sig(Bn)	<An>	d(An)	sig(An)
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1	0	1	2	0	2	2.
2	0	10.	4	-1.5	8.	2
3	0	.4	.4	0	1	2.
4	0	1.	.4	0.4	1.5	.6
5	0	.2	.4	0	.2	.4
6	0	1.	.2	-0.1	0.8	.4
7	0	.1	.2	0	.1	.2
8	0	.2	.2	0.	.2	.2
9	0	.1	.4	0	.1	.2
10	0	.1	.2	0.	.1	.2

Expected values of harmonics in RETURN END at ALL current (Unit-m)

n	<Bn>	d(Bn)	sig(Bn)	<An>	d(An)	sig(An)
1	0	1	2.	0.	.5	2.
2	0.	3	2.	0.	1.5	2.
3	.0	.1	.2	.0	.2	1.
4	0.	0.5	.4	.0	.2	.2
5	0.	.1	.2	.0	.2	.4
6	0.	.2	.2	.0	.2	.2
7	0.	.1	.2	.0	.1	.2
8	0.	.2	.2	.0	.1	.2
9	0.	.1	.2	0	.1	.2
10	0.	.1	.2	0	.1	.2

Notes:

1. The harmonics are given at the center of dipole at 5.7 cm radius
The coil radius is 9 cm.

The same numerical values of harmonics are expected in the case of the 20 cm aperture DX magnet, if the reference radius is changed to 62.5 mm.

2. These are the provisional values for evaluating the basic proposal.
The final values should be within 20% of the above harmonics.

9/8/94

3. This version includes the harmonics from Gerry Morgan's Latest Design Note No. 540-1 (RHIC-MD-241).

***** The harmonics are quoted at 60 mm Reference Radius. *****

5/1/96

4. The table is modified as per Gerry Morgan's Design Note No. 554-1 (RHIC-MD-255), dated 4/30/96.
5. A_n and B_n in the Ends come from Gerry Morgan's calculations and dA_n and dB_n in the ends come from the measurements in 10 cm aperture D0 magnet.

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