SFU (1–26) magnetic measurements

OVERVIEW

PS MAXIMUM CURRENT:
10 A (horizontal coils)
10 A (vertical coils)

BENDING:
horizontal bending (B_Y)
vertical bending (B_X)

PRE-CYCLING:
10 A → –10 A → 10 A

DEGAUSSING:
I_{ANY} → 10 A → –2 A → OFF

CONSTANT EFFECTIVE LENGTH:
31.6 mm

FIELD INITIAL SLOPE:
7.448 Gauss/Amp (magnet #15)

LINEARITY:
linear up to 4 A
nonlinearity –1% at 10 A

STRAIGHT FIELD INTEGRALS:
0.233 mTm at 10 A (±0.7% over all magnets)

SFU (1–26) magnetic measurements

Measurements done by Roland Deckardt. Header data are due to copy/paste not entirely correct.

	single line X = 0: AZERO OFF, APER = 20 ms, SPEED = 24 mm/s, AC ON 24.5 ˚C, MSG 2.3 ±10 A					
#N	**date**	**B_Y (+10 A)**	**B_Y (−10 A)**	**B_X (+10 A)**	**B_X (−10 A)**	**pre-cycle**
15	3 Dec 2015 14:47		I03[1] I04[2] I05[3] I06[4]		I09[5]	**1x**
14	4 Dec 2015 16:23	**I01**	**I02**	**I03**	**I04**	**3x**
16	7 Dec 2015 11:17	**I01[6]**	**I02[6]**	**I03[6] I05 I08**	**I04[6] I06 I07**	**3x**
17	7 Dec 2015 13:48					
18	7 Dec 2015 14:27					
19	7 Dec 2015 15:48			**I01 I03**	**I02 I04**	**3x**
20	7 Dec 2015 16:09					
21	7 Dec 2015 16:49					
22	8 Dec 2015 11:00					
23	8 Dec 2015 13:57					
24	8 Dec 2015 14:43	**I01**	**I02**	**I03**	**I04**	**3x**
25	8 Dec 2015 15:38					
13	8 Dec 2015 16:23					
11	8 Dec 2015 17:07	**I01 I03**	**I02 I04**	**—**	**—**	**3x**
12	9 Dec 2015 10:35	**I01**	**I02**	**I03**	**I04**	**1x**
9	9 Dec 2015 13:43	**I01**	**I02**	**I03 I05**	**I04 I06**	**1x**
10	9 Dec 2015 16:37					
7	9 Dec 2015 17:11					
8	9 Dec 2015 17:34					
6	10 Dec 2015 9:43					
5	10 Dec 2015 10:21					
4	10 Dec 2015 11:02	**I01**	**I02**	**I03**	**I04**	**1x**
3	10 Dec 2015 13:56					
2	10 Dec 2015 14:23					
1	10 Dec 2015 15:58					
26	10 Dec 2015 15:35					

[1] AZERO ON, SPEED = 49 mm/s   [3] AZERO ON, I_{HALL} = 0   [5] pre-cycle 3x
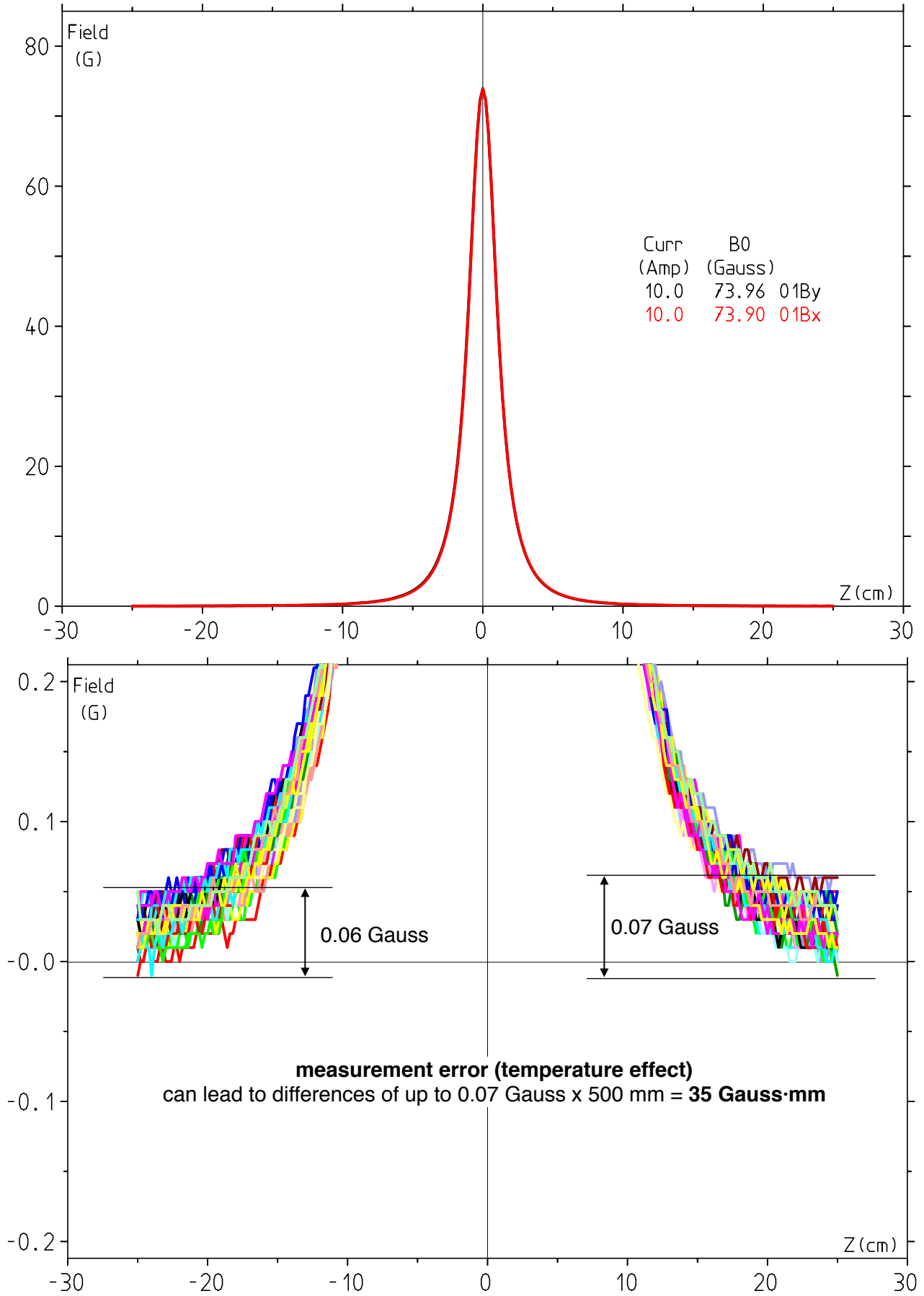[2] AZERO ON   [4] SPEED = 0   [6] AC OFF 26.5 ˚C

SFU (1–26) magnetic measurements

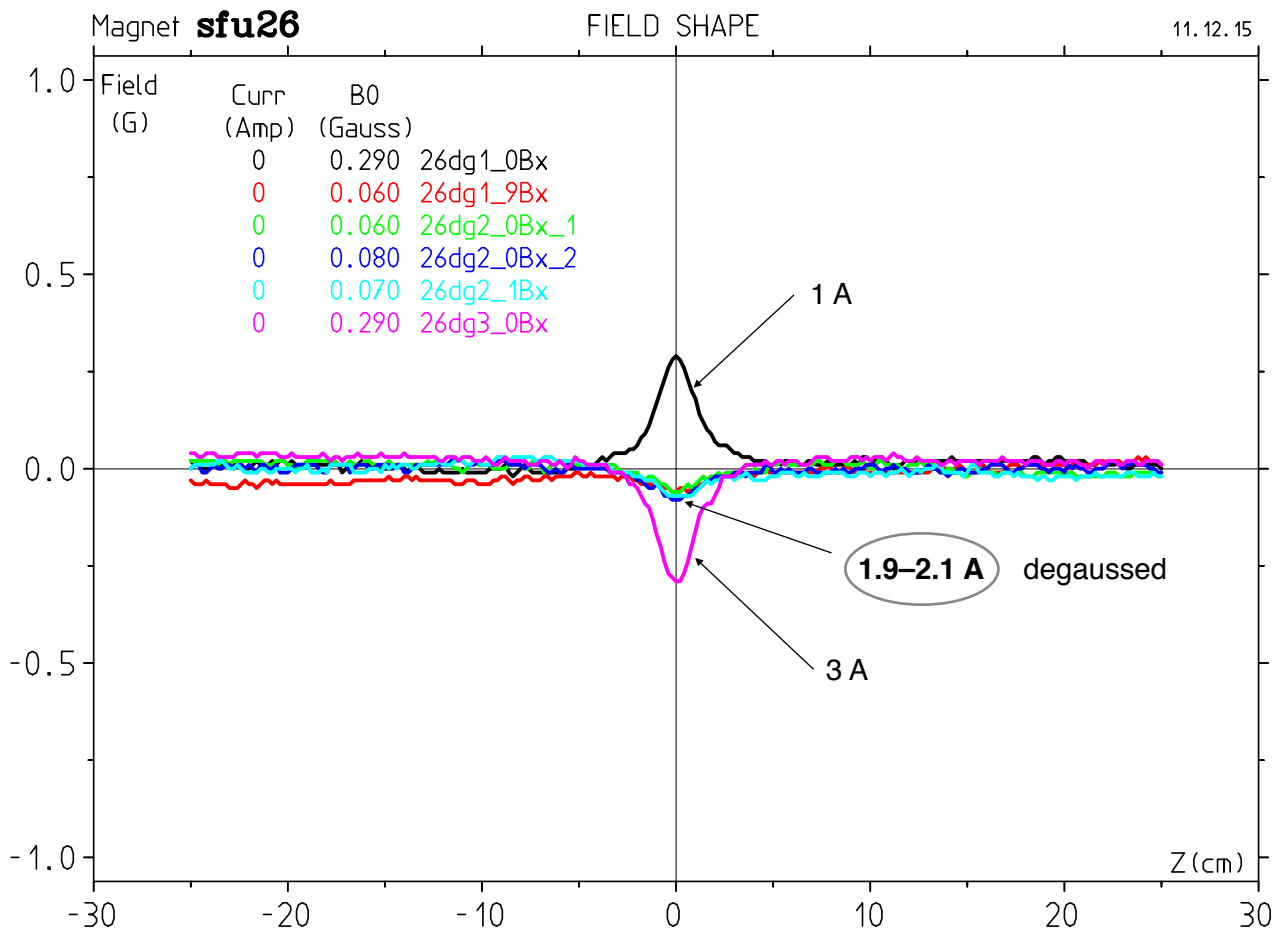**FIELD INTEGRALS**: l01-l02-l03-l04 assumed for all magnets to be files of B_Y ±10 A, B_X ±10 A

#N	$B_Y \cdot dz$ [Gmm]	rel	Leff [mm]	$B_X \cdot dz$ [Gmm]	rel	Leff [mm]
1	2334.2	0.05%	31.6	2323.3	-0.18%	31.4
2	2344.8	0.50%	31.5	2334.0	0.28%	31.4
3	2332.3	-0.03%	31.5	2323.6	-0.17%	31.4
4	2342.5	0.40%	31.6	2327.9	0.02%	31.4
5	2321.0	-0.52%	31.5	2314.1	-0.57%	31.7
6	2336.2	0.13%	31.7	2306.8	-0.89%	31.5
7	2316.0	-0.73%	31.6	2325.4	-0.09%	31.6
8	2323.7	-0.40%	31.5	2320.3	-0.31%	31.5
9	2335.0	0.08%	31.7	2319.8	-0.33%	31.5
10	2341.3	0.35%	31.7	2323.8	-0.16%	31.4
11	2327.1	-0.26%	31.7	2318.1	-0.40%	31.5
12	2323.8	-0.40%	31.5	2319.3	-0.35%	31.5
13	2325.4	-0.33%	31.5	2329.6	0.09%	31.5
14	2330.2	-0.12%	31.6	2341.2	0.59%	31.7
16	2337.4	0.19%	31.6	2323.1	-0.19%	31.5
17	2336.0	0.13%	31.6	2331.6	0.18%	31.6
18	2333.3	0.01%	31.6	2331.7	0.18%	31.7
19	2337.3	0.18%	31.6	2331.5	0.17%	31.5
20	2332.8	-0.01%	31.7	2326.6	-0.04%	31.7
21	2341.4	0.36%	31.6	2338.5	0.47%	31.7
22	2332.2	-0.04%	31.6	2336.8	0.40%	31.7
23	2333.9	0.04%	31.6	2329.6	0.09%	31.7
24	2335.0	0.08%	31.6	2334.9	0.32%	31.6
25	2344.6	0.49%	31.6	2338.4	0.47%	31.6
26	2329.2	-0.17%	31.6	2336.4	0.38%	31.7
	2333.1	-0.73%	31.6	**2327.5**	-0.89%	31.6
		0.50%			0.59%	

V. Vranković, Tuesday, 16 August 2016

SFU (1–26) magnetic measurements

Curr   B0
(Amp) (Gauss)
10.0   73.96 01By
10.0   73.90 01Bx

0.06 Gauss

0.07 Gauss

measurement error (temperature effect)
can lead to differences of up to 0.07 Gauss x 500 mm = **35 Gauss·mm**

SFU (1–26) magnetic measurements

26dgB$_X$	degaussing	B$_X$dz	B$_{MIN}$	B$_{MAX}$
I05	10 —> 0	151.2	0.2	1.1
I17	10 —> -1 —> 0	12.8	-0.0	0.3
I18	-10 —> 1 —> 0			
I13	10 —> -1.9 —> 0	-9.0	-0.1	0.0
I14	-10 —> 1.9 —> 0			
I06	10 —> -2 —> 0	0.5	-0.1	0.0
I07	-10 —> 2 —> 0			
I11	10 —> -2.0 —> 0	-1.7	-0.1	0.0
I12	-10 —> 2.0 —> 0			
I09	10 —> -2.1 —> 0	-3.7	-0.1	0.0
I10	-10 —> 2.1 —> 0			
I15	10 —> -3 —> 0	2.2	-0.3	0.0
I16	-10 —> 3 —> 0			

Magnet **sfu26**　　　　FIELD SHAPE　　　　11.12.15

Curr (Amp)	B0 (Gauss)	
0	0.290	26dg1_0Bx
0	0.060	26dg1_9Bx
0	0.060	26dg2_0Bx_1
0	0.080	26dg2_0Bx_2
0	0.070	26dg2_1Bx
0	0.290	26dg3_0Bx

1 A

1.9–2.1 A degaussed

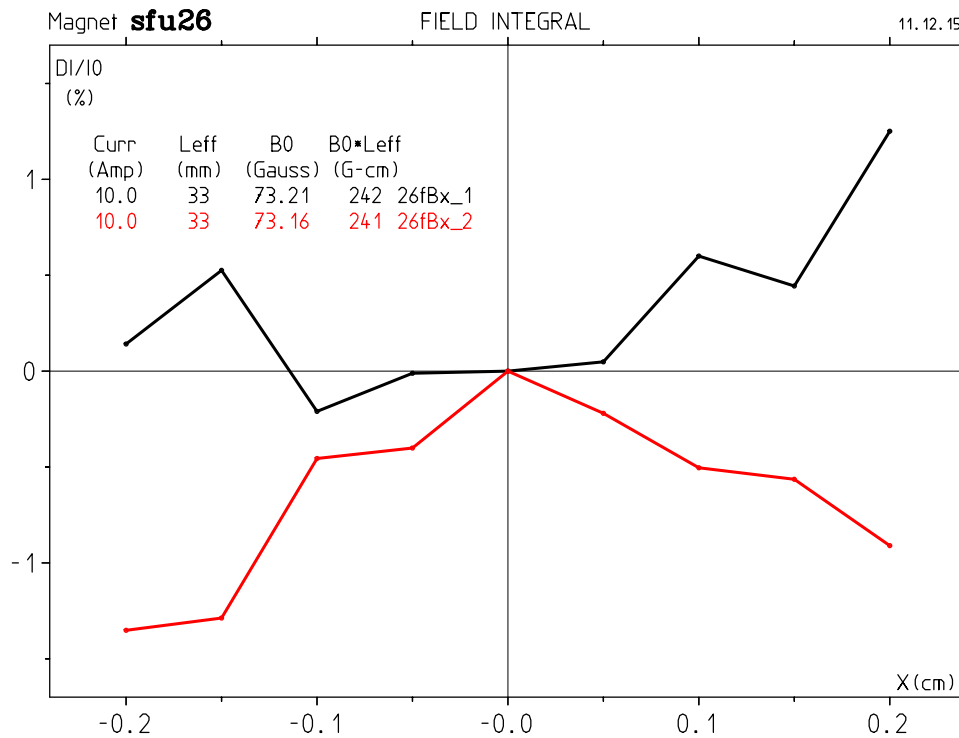3 A

V. Vranković, Tuesday, 16 August 2016
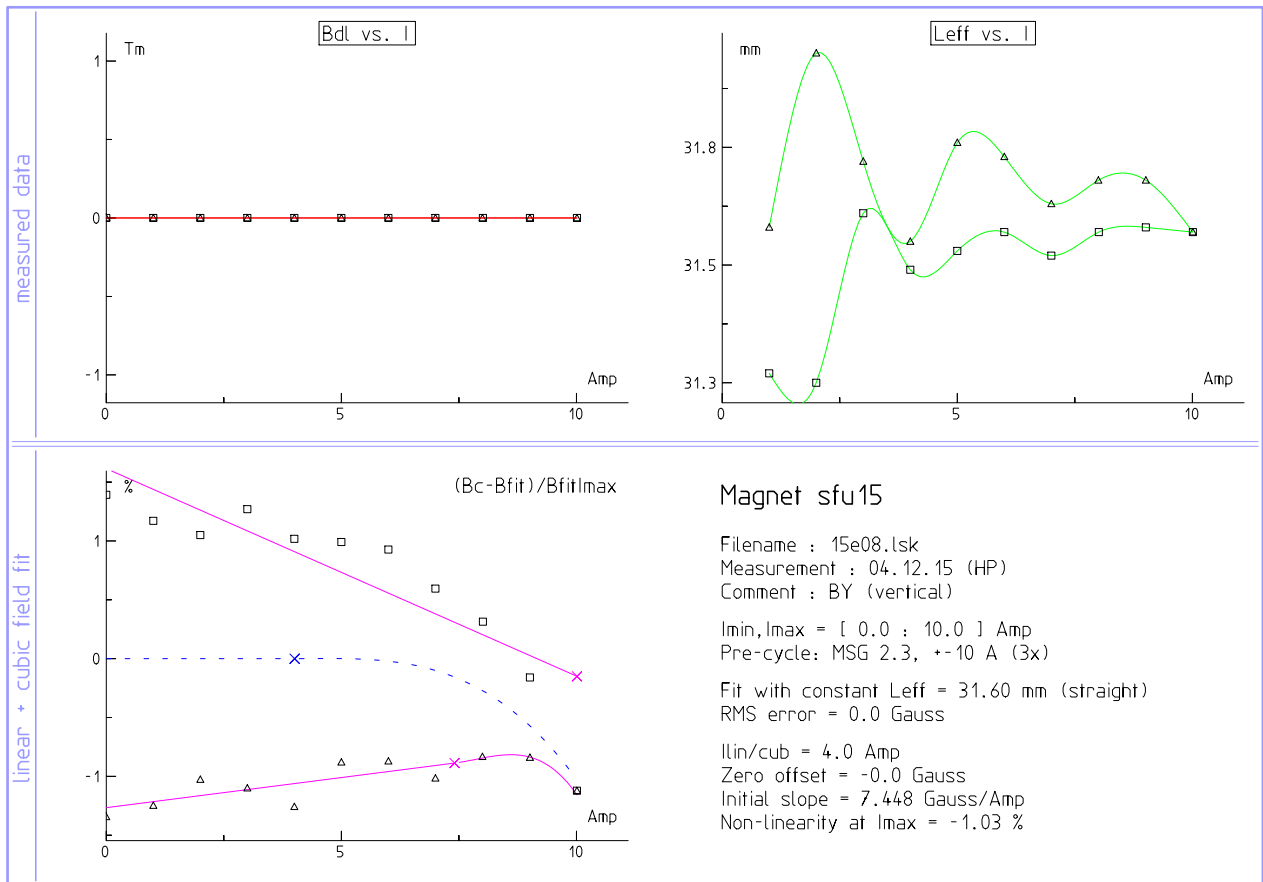
SFU (1–26) magnetic measurements

non-degaussed, AZERO unknown, APER = 20 ms, SPEED = 49 mm/s, ACON @24.5 ˚C, MSG 2.3 ±10 **A**
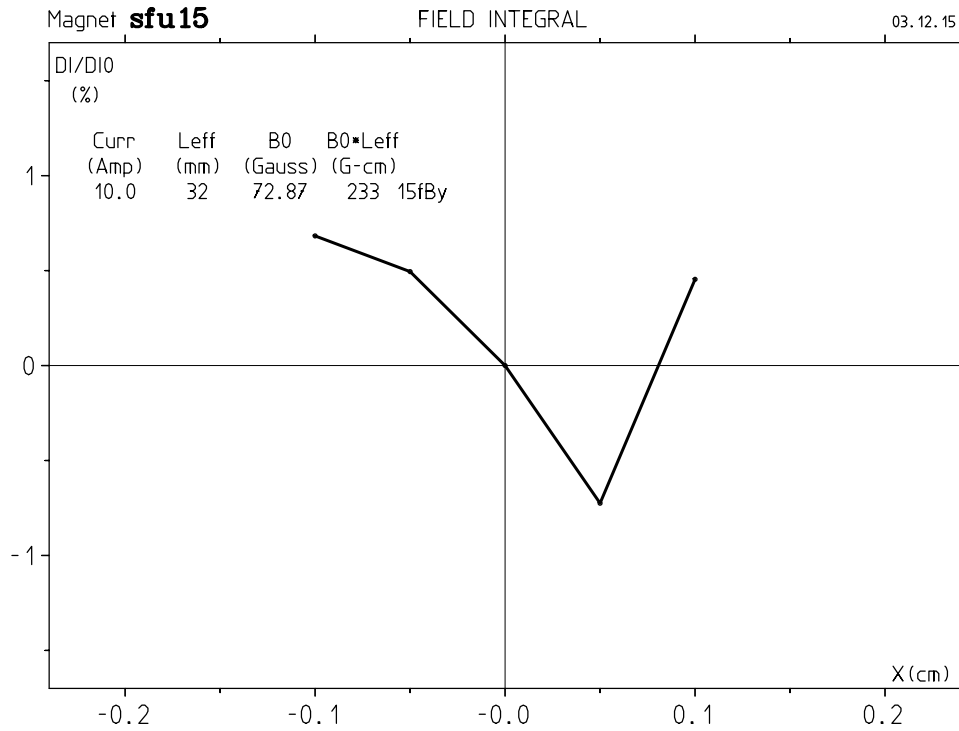
degaussed, AZERO OFF, APER = 20 ms, SPEED = 24 mm/s, ACON @24.5 ˚C, MSG 2.3 ±10 A

V. Vranković, Tuesday, 16 August 2016

SFU (1–26) magnetic measurements

Magnet sfu15

Filename : 15e08.lsk
Measurement : 04.12.15 (HP)
Comment : BY (vertical)

Imin,Imax = [0.0 : 10.0] Amp
Pre-cycle: MSG 2.3, +-10 A (3x)

Fit with constant Leff = 31.60 mm (straight)
RMS error = 0.0 Gauss

Ilin/cub = 4.0 Amp
Zero offset = -0.0 Gauss
Initial slope = 7.448 Gauss/Amp
Non-linearity at Imax = -1.03 %

lsklis © (build 3.1c) / 16-AUG-2016