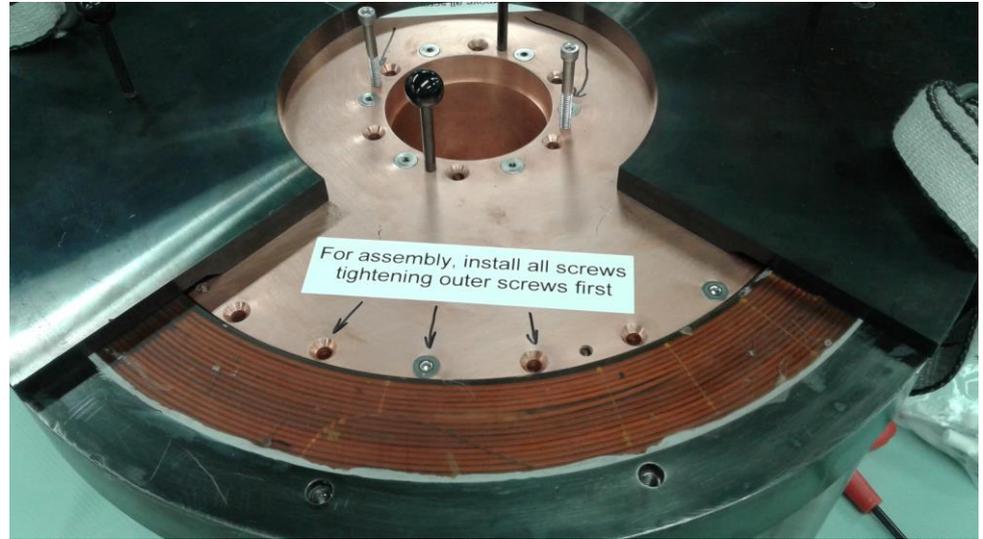
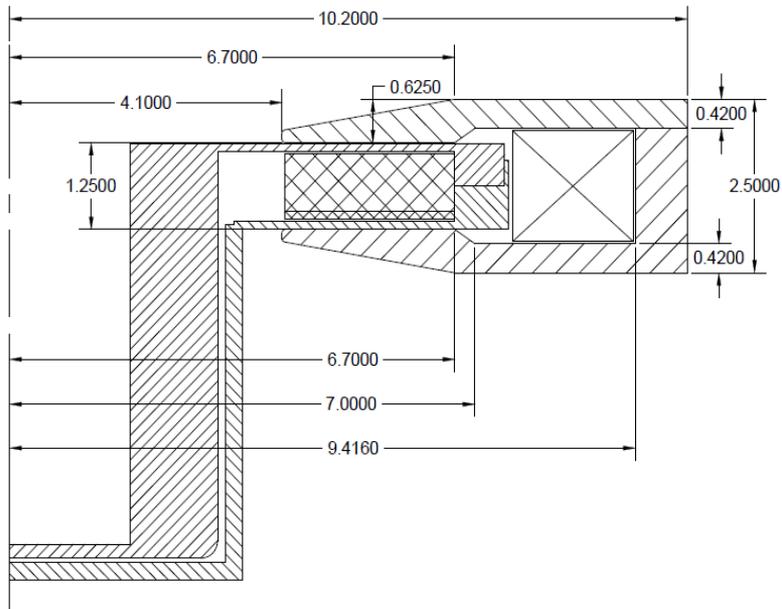
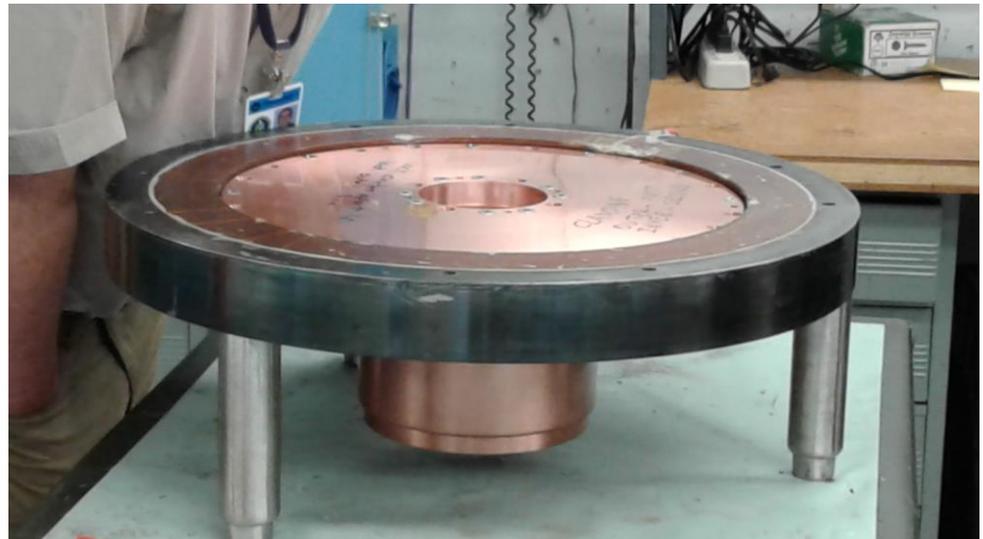


Ring Test Magnet Calibration



Wound number of turns in the coil of the magnet is questioned.
To get an educated guess, measurements were made of the magnetic field in the gap without garnet ring.

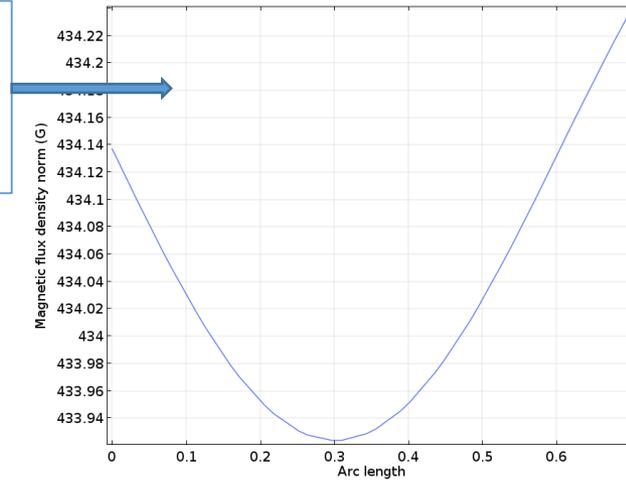
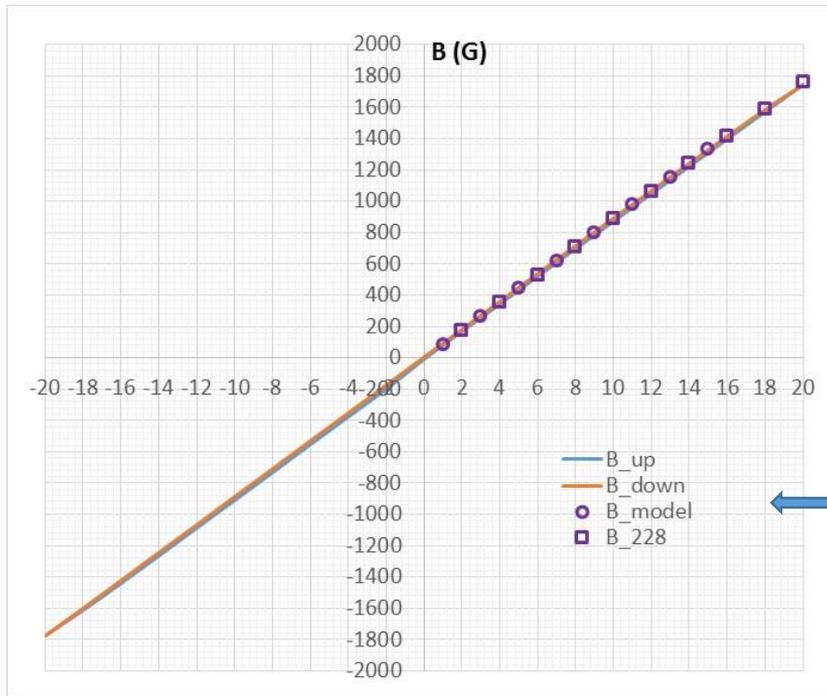


Field quality without garnet disk

Modeling results for the field at $R = 5.4''$
in the middle of the gap with $N = 224$

I (A)	1	3	5	7	9	11	13	15	17
B (G)	85.614	259.25	433.93	608.75	783.45	957.86	1131.7	1304.8	1476.8

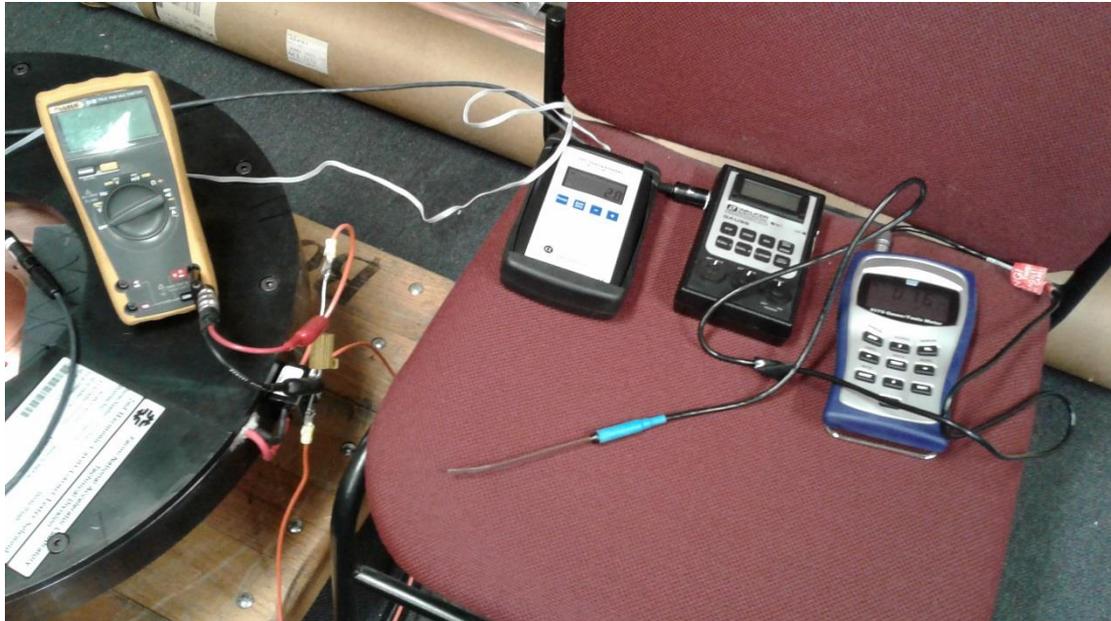
Expected magnetic field along the vertical line $R = 5.4''$ between the poles at 5 A with $N = 224$



The measured field is quite linear with the current. This allows using linearization when the number of turns in the coil is changed.

Calibration session on July 19, 2017

#1 #2 #3



Magnetometers #1 and #3 were calibrated back in Febr. 2015 when the magnetization curve of the garnet was studied. This calibration indicated that the magnetometer #1 shows the field that is $\sim 4\%$ higher. The magnetometer #3 was $\sim 1\%$ lower.

During this session, reading of #2 and #3 were almost identical.

Mutual calibration of #1 and #2 did show that #1 readings are $\sim 5\%$ higher.

Measurement Data: Raw

#1

I (A)	B1_up	B1_down
-14	1240	1240
-12	1073	1065
-10	901	888
-8	724	709.5
-6	545.5	533
-4	366.6	355
-3	277.7	267
-2	187.2	180
-1	98.6	93.6
0	8	-9
1	-95	-100
2	-172	-190
3	-263	-280
4	-353	-370
6	-533.5	-550
8	-715	-730
10	-894.5	-906
12	-1075.5	-1080
14	-1256	-1256

#2 & #3

I (A)	B1_up	B1_down
-14	1174	1174
-12	1017	1007
-10	852	840
-8	685	671
-6	516	504
-4	347	336
-3	263	254
-2	178	172
-1	94	89.3
0	9	-9
1	-90	-95
2	-159	-181
3	-245	-265
4	-330	-350
6	-500	-520
8	-670	-688
10	-840	-855
12	-1010	-1020
14	-1180	-1180

Measurement Data - Corrected

#1

I (A)	B1_up	B1_down	Model_320
-14	1192	1192	1208
-12	1032	1024	1035
-10	866	854	863
-8	696	682	690
-6	525	513	518
-4	353	341	345
-3	267	257	259
-2	180	173	173
-1	95	90	86
0	8	-9	0
1	-91	-96	-86
2	-165	-183	-173
3	-253	-269	-259
4	-339	-356	-345
6	-513	-529	-518
8	-688	-702	-690
10	-860	-871	-863
12	-1034	-1038	-1035
14	-1208	-1208	-1208

#2 & #3

I (A)	B1_up	B1_down	Model_320
-14	1191.61	1191.61	1208
-12	1032.255	1022.105	1035
-10	864.78	852.6	863
-8	695.275	681.065	690
-6	523.74	511.56	518
-4	352.205	341.04	345
-3	266.945	257.81	259
-2	180.67	174.58	173
-1	95.41	90.6395	86
0	9.135	-9.135	0
1	-91.35	-96.425	-86
2	-161.385	-183.715	-173
3	-248.675	-268.975	-259
4	-334.95	-355.25	-345
6	-507.5	-527.8	-518
8	-680.05	-698.32	-690
10	-852.6	-867.825	-863
12	-1025.15	-1035.3	-1035
14	-1197.7	-1197.7	-1208

Linearized modeling results fit the data with **N = 320**.