Møller notation	Q1	Q2	Q3	-	Dipole
Name	*PATSY*	*TESSA*	*FELICIA*	*JACKIE*	*LILLY*
Relevant information					
Element	quad	quad	quad	quad	dipole
Bore, cm	10.16	10.16	10.16	10.16	
Effective length, cm	45.72	35.66	35.66	45.72	164.27
Maximum current, A	300	280	280	300	550
Pole tip field at 100A, kGs	2.029	2.371	2.420	≈2.03	2.727
Pole tip field at 300A, kGs	5.801	6.029	6.135	5.809	
Integrated GL at 100A, Gs	18308	17112	17524	≈18300	
Other technical information					
Manufacturer	MagnaTek	Indust.Coil	Indust.Coil		
Part number	LA-446205	LA-446201	LA-446200		
Yoke type	Solid	Solid	Solid		
Yoke material	1006	1006	1006		
Weight, kg	450	500	500		
Color	Red	Blue	Blue	Blue	
Number of coils	4	4	4	4	4
Num. of turns per coil	42	50	50	42	32
Resistance @20C°, ohm	0.1133	0.0767	0.0767		
Shunts and sec. coils	none	none	none	none	none
Voltage drop at max cur	10.6VDC	8.5VDC	8.5VDC		
Total water flow	1.5gpm	1.0gpm	1.0gpm		
Max. oper. pressure	35psi	35psi	35psi		
Cooling medium	LCW	LCW	LCW		

Table 1: Hall A Moller Quadrupole Parameters

Quad 1 Radius= 4.96cm Length= 44.77cm						
Current	B_{pole}	$\int$G.dl (Gauss)				
(A)	(Gauss)	Quadrupole	Sextupole	Octupole	Decapole	Dodecapole
0.00	32.00	290.00	0.32	0.17	0.03	1.51
49.94	1014.50	9143.00	10.97	1.83	1.83	16.46
100.24	1997.00	18070.00	28.91	3.61	3.61	32.53
150.14	2976.00	26910.00	40.36	5.38	5.38	48.44
200.09	3954.00	35710.00	53.57	14.28	7.14	74.99
249.93	4918.00	44350.00	70.96	22.17	8.87	115.31
299.15	5801.50	52040.00	98.88	26.02	10.41	161.32
Quad 2 Radius= 5.00cm Length= 36.74cm						
Current	B_{pole}	$\int$G.dl (Gauss)				
(A)	(Gauss)	Quadrupole	Sextupole	Octupole	Decapole	Dodecapole
0.00	31.00	228.00	1.35	0.09	0.16	1.48
50.56	1187.00	8789.00	25.49	0.88	1.76	23.73
100.26	2329.50	17140.00	63.42	5.14	1.71	47.99
150.08	3450.00	25340.00	101.36	5.07	2.53	68.42
200.04	4530.00	33250.00	139.65	6.65	6.65	93.10
250.20	5418.50	39750.00	155.03	7.95	7.95	123.22
299.04	6029.50	43980.00	153.93	8.80	8.80	145.13
Quad 3 Radius= 5.00cm Length= 36.50cm						
Current	B_{pole}	$\int$G.dl (Gauss)				
(A)	(Gauss)	Quadrupole	Sextupole	Octupole	Decapole	Dodecapole
0.00	30.00	229.00	1.92	0.25	0.25	1.56
50.11	1208.00	8783.00	21.96	0.88	0.88	22.84
100.28	2379.00	17290.00	43.23	1.73	1.73	43.23
150.07	3528.50	25570.00	63.92	2.56	2.56	66.48
199.95	4634.00	33540.00	83.85	6.71	3.35	97.27
249.99	5533.50	40030.00	100.08	8.01	8.01	128.10
299.03	6135.00	44240.00	110.60	8.85	4.42	154.84

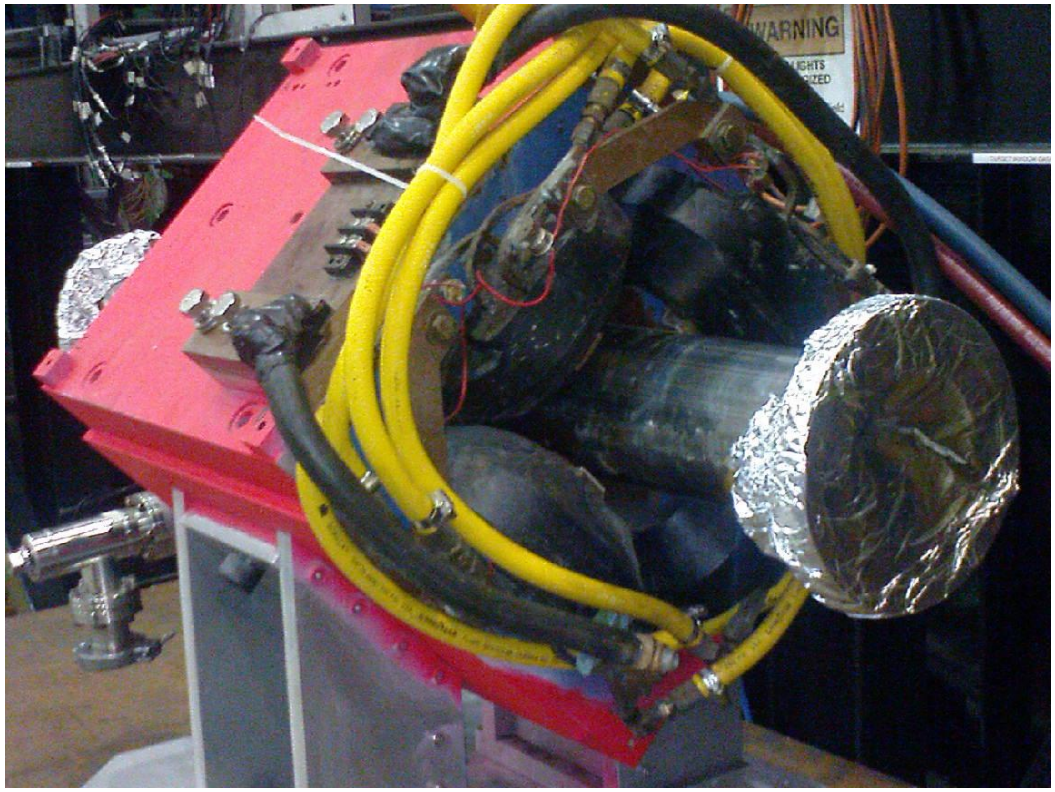
Q1=PATSY=MQM1H02 Field Mapping Results

Was done:

- GL measurement (string R=4.85cm)

- B measurement (Hall probe R~4.85cm) along the quad with fringe fields

- B measurement near the pole on the beam line (Hall probe)



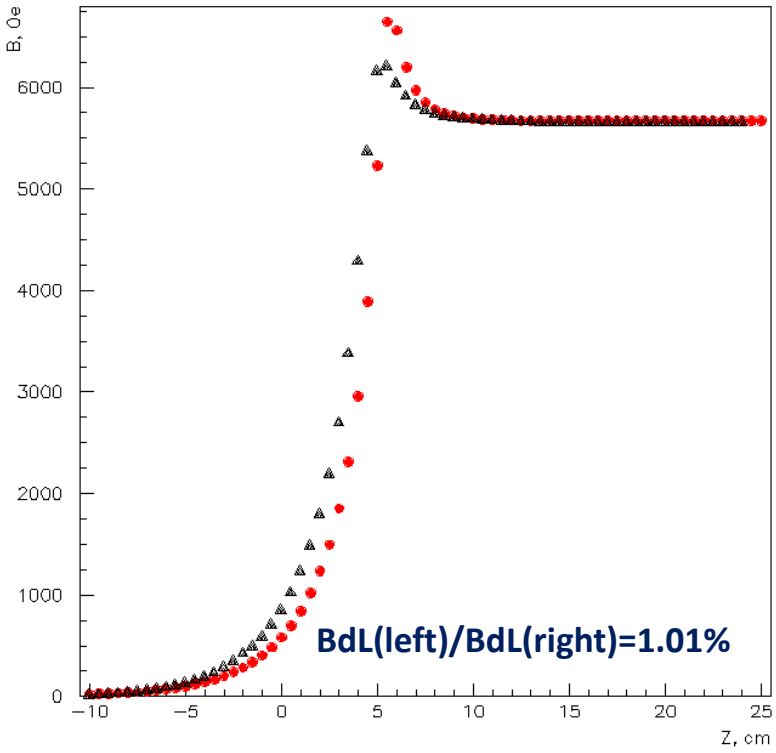
Results

Set Sur.(A)	Readback Current(A)	GL, G measur	Field, G R=4.85cm	Field, G R=5.08cm	HPr G
-300.	-298.92	-52279.4	-5657.64	-5938.18	-5560
-250.	-249.36	-43945.1	-4755.71	-4991.53	-4669
-200.	-198.01	-35298.7	-3820.00	-4009.42	-3750
-150.	-149.68	-26480.6	-2865.71	-3007.81	-2811
-100.	-100.11	-17643.0	-1909.31	-2003.99	-1873
-50.	-50.33	-8755.3	-947.49	-994.48	-930
-10.	-10.49	-1648.3	-178.38	-187.22	-175
0.	0.0	235.7	25.51	26.78	24
10.	10.47	2119.8	229.40	240.78	221
50.	50.25	9237.0	999.62	1049.19	979
100.	100.02	18137.9	1962.87	2060.20	1929
150.	149.70	26986.4	2920.45	3065.26	2877
200.	199.43	35810.7	3875.41	4067.58	3828
250.	249.05	44466.6	4812.15	5050.76	4760
300.	298.92	52321.4	5667.07	5942.95	5604

Transducer (V)	I (A)	BL (G-cm)	B (G)	Leff, cm
5.98	298.99	253514.7	-5668.4	44.77

Chamber Dimension (in)

OD	4
ID	3.87



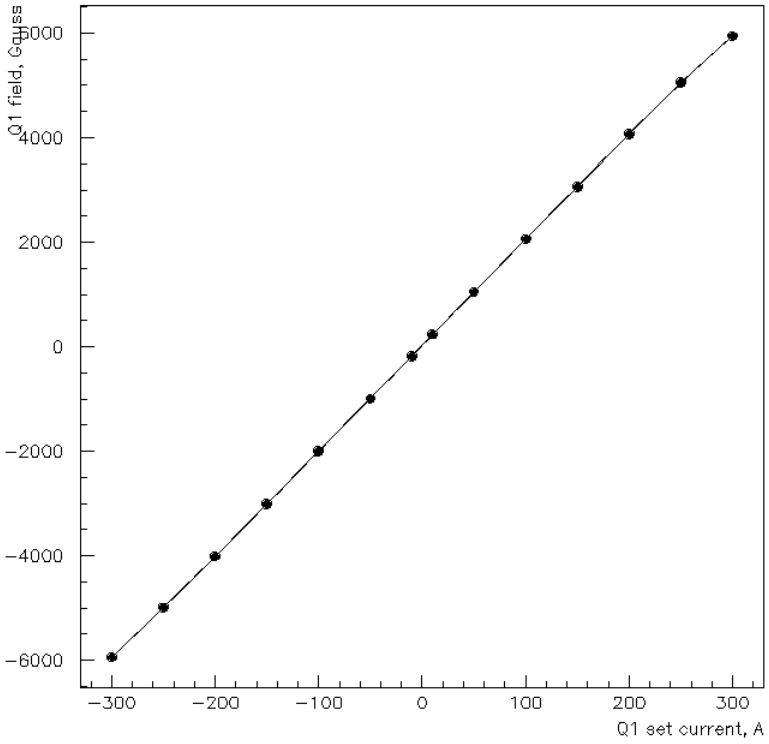
Q1:

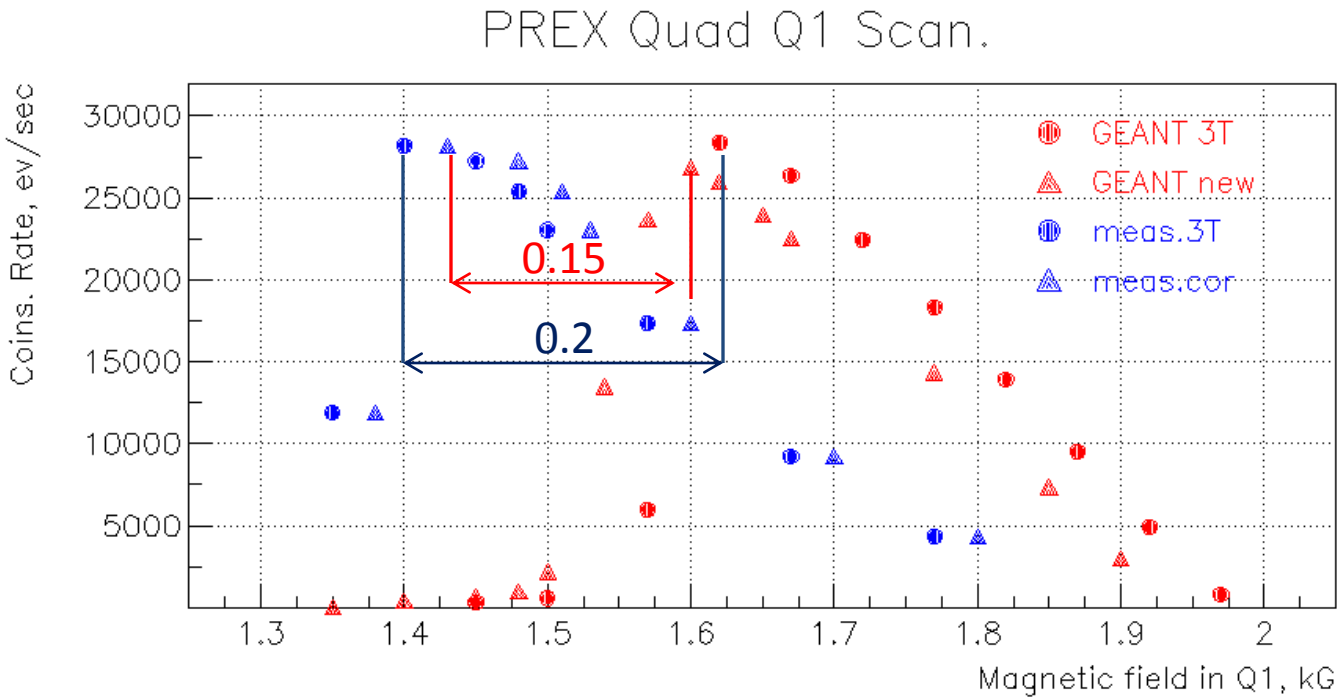
L_{eff}(old) 45.05cm → 44.77cm

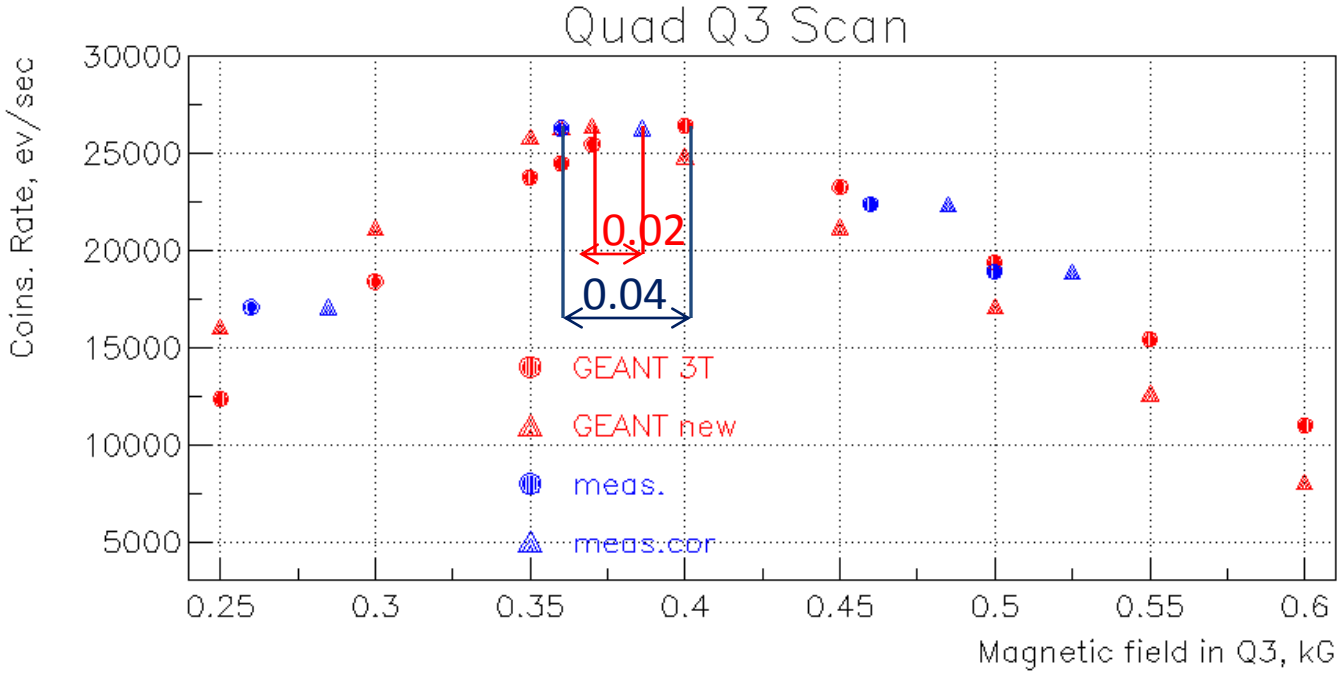
GEANT field R=5.08 → acceler. R=4.96cm

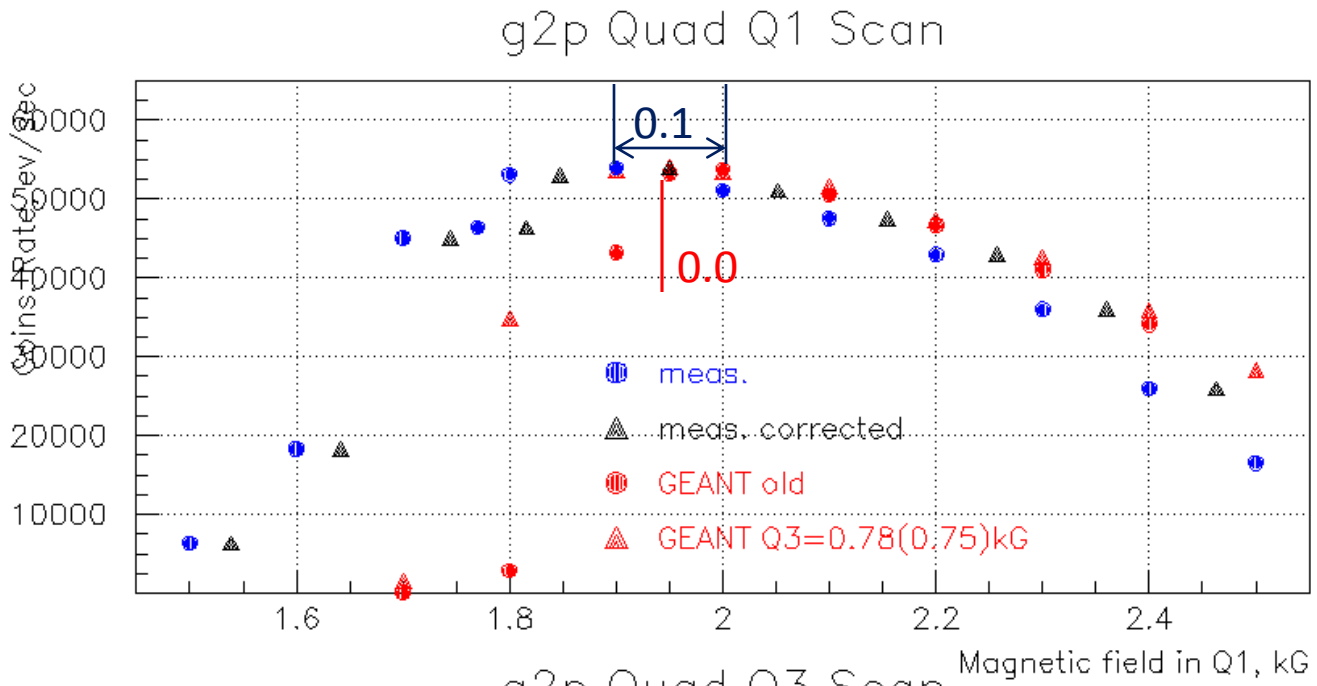
Coef. B→ GL→ A constant → fit

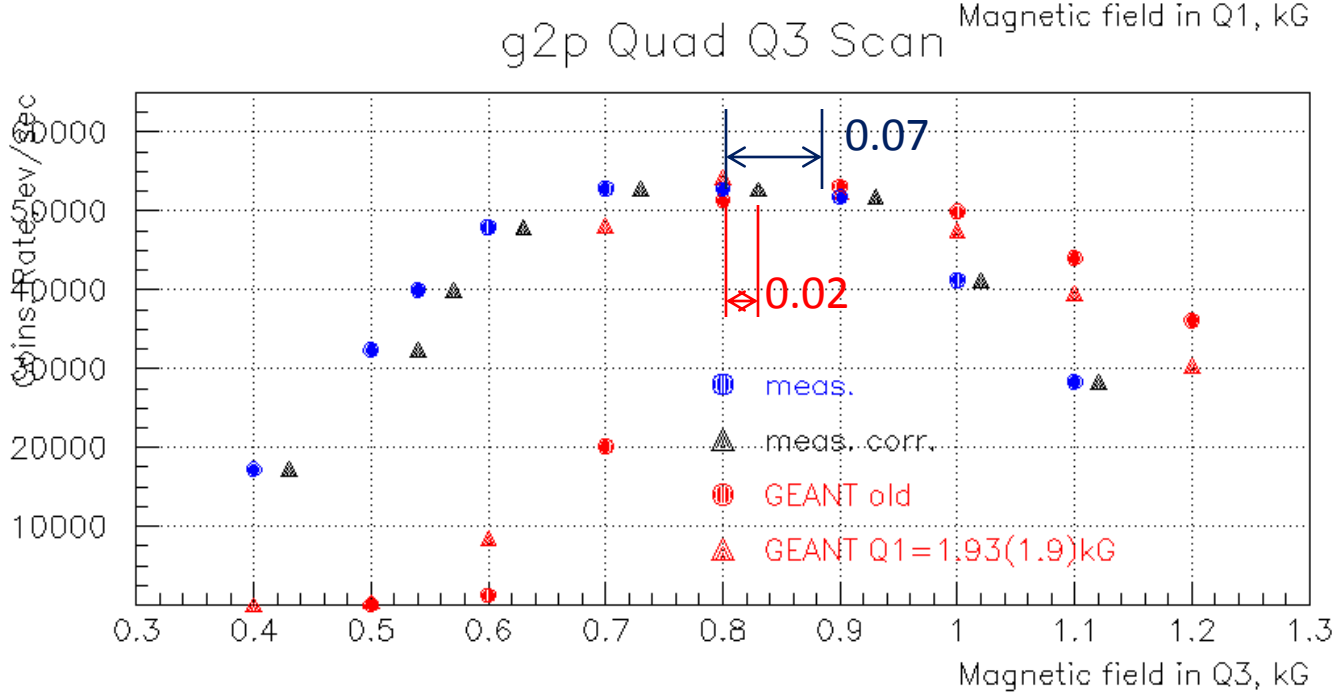
0A=0Gauss → 0A=26Gauss




PREX Quad Q1 Scan.
Coins. Rate, ev/sec
30000
25000
20000
15000
10000
5000
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2
Magnetic field in Q1, kG
GEANT 3T
GEANT new
meas.3T
meas.cor
0.15
0.2


Quad Q3 Scan
Coins. Rate, ev/sec
30000
25000
20000
15000
10000
5000
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
Magnetic field in Q3, kG
GEANT 3T
GEANT new
meas.
meas.cor
0.02
0.04


g2p Quad Q1 Scan
Coins #Rate/5ev/sec
50000
40000
30000
20000
10000
1.6
1.8
2
2.2
2.4
Magnetic field in Q1, kG
0.1
0.0
meas.
meas. corrected
GEANT old
GEANT Q3=0.78(0.75)kG


g2p Quad Q3 Scan
Coins #Rate/5ev/sec
50000
40000
30000
20000
10000
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
1.3
Magnetic field in Q3, kG
0.07
0.02
meas.
meas. corr.
GEANT old
GEANT Q1=1.93(1.9)kG