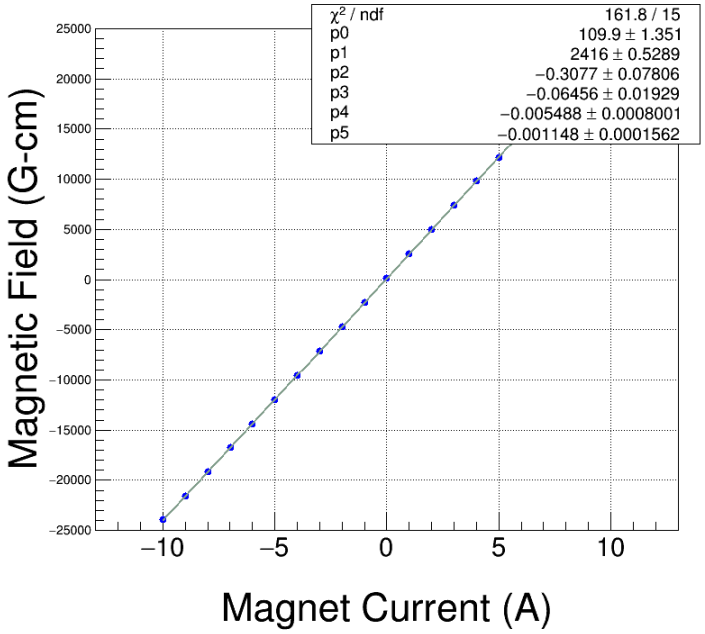
MDL0L02 Dipole Field Offset

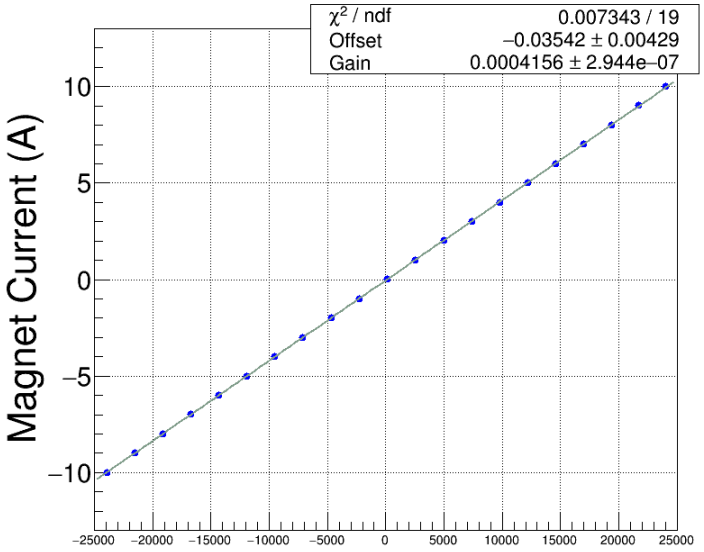
August 12, 2016

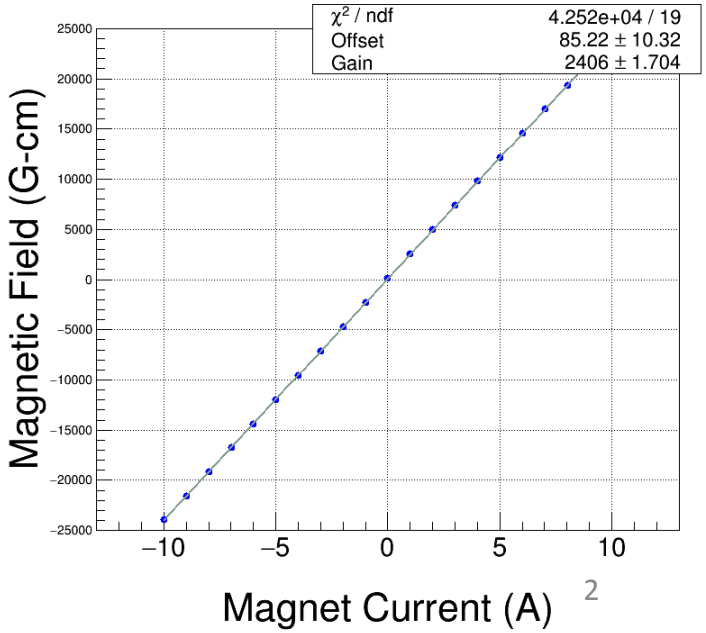
Field Map

Meas. Date: 8/29/2014
Coil used: Hall Probe Stepper

Current (A)	Strength (Gauss-cm)
-9.992	-23944.2
-8.996	-21569.6
-7.991	-19169.0
-6.990	-16769.5
-5.990	-14360.7
-4.993	-11954.6
-3.994	-9542.8
-2.989	-7116.1
-1.989	-4698.2
-0.990	-2283.6
0.003	126.0
1.009	2548.4
2.009	4960.8
3.009	7374.6
4.010	9785.8
5.010	12192.0
6.010	14589.8
7.011	16980.4
8.013	19360.4
9.015	21720.5
10.014	24038.1

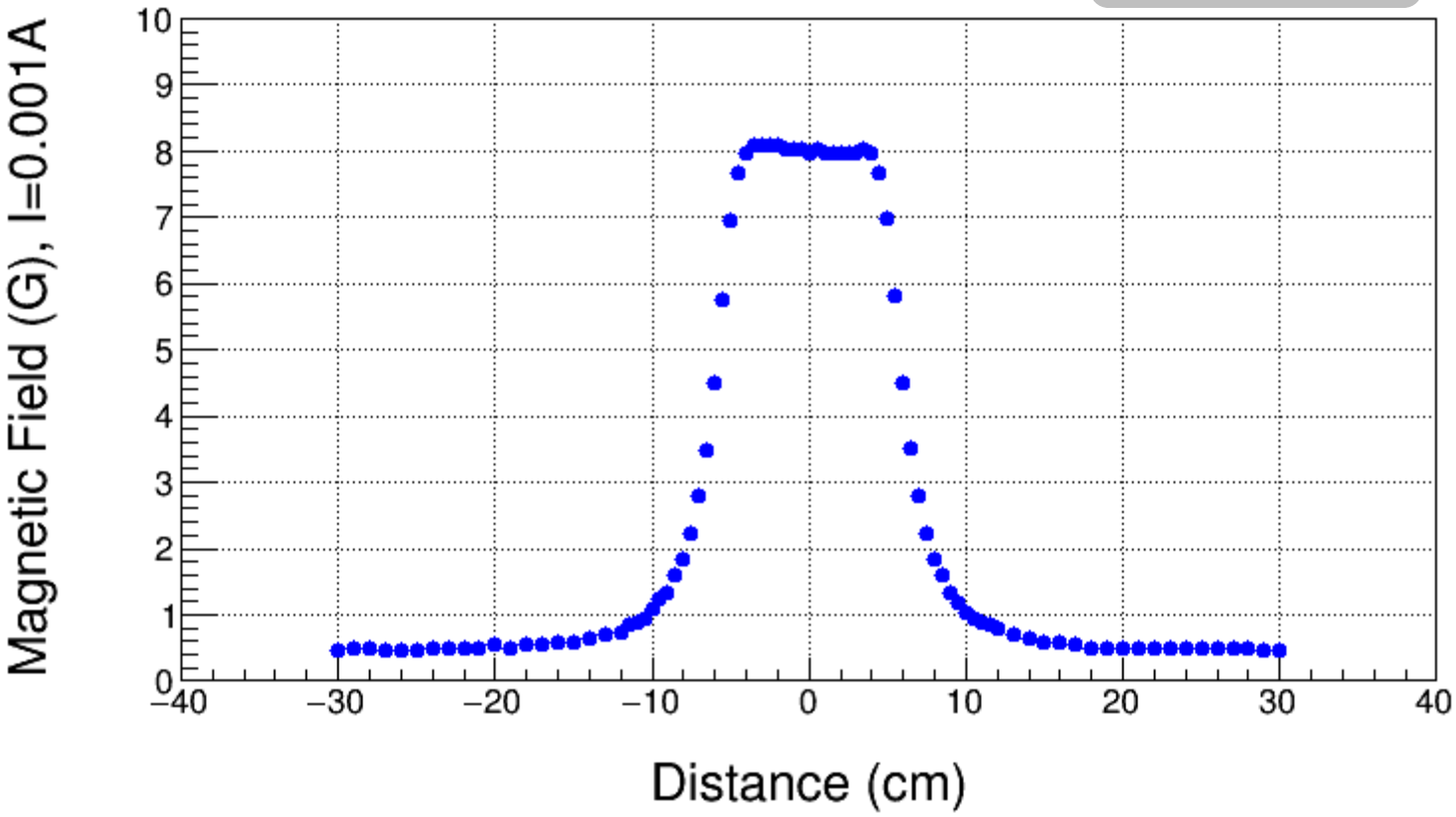






Field Map, I=0.001A

On Hysteresis

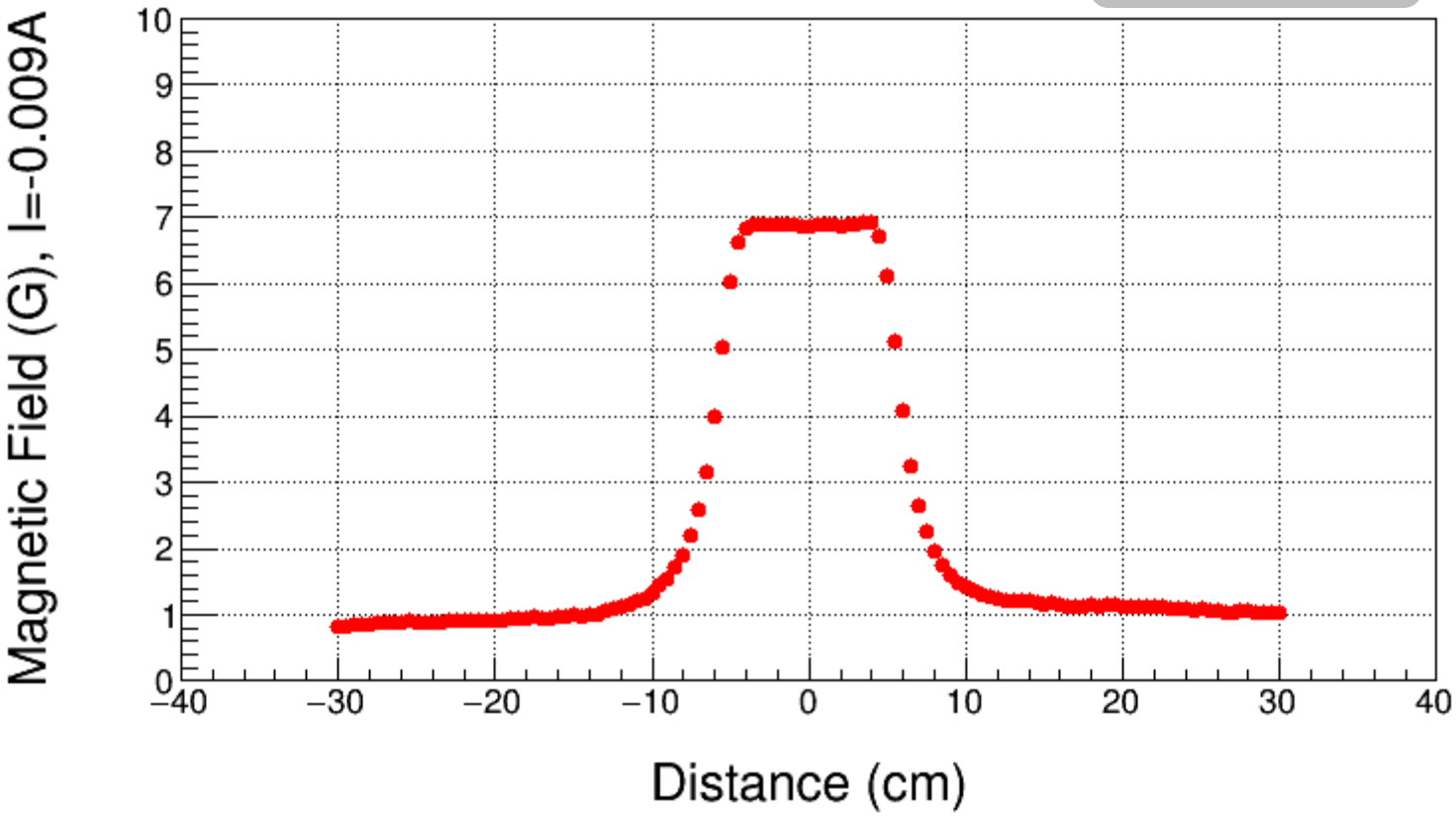


August 10, 2016

SPARE DL MAGNET AT MMF

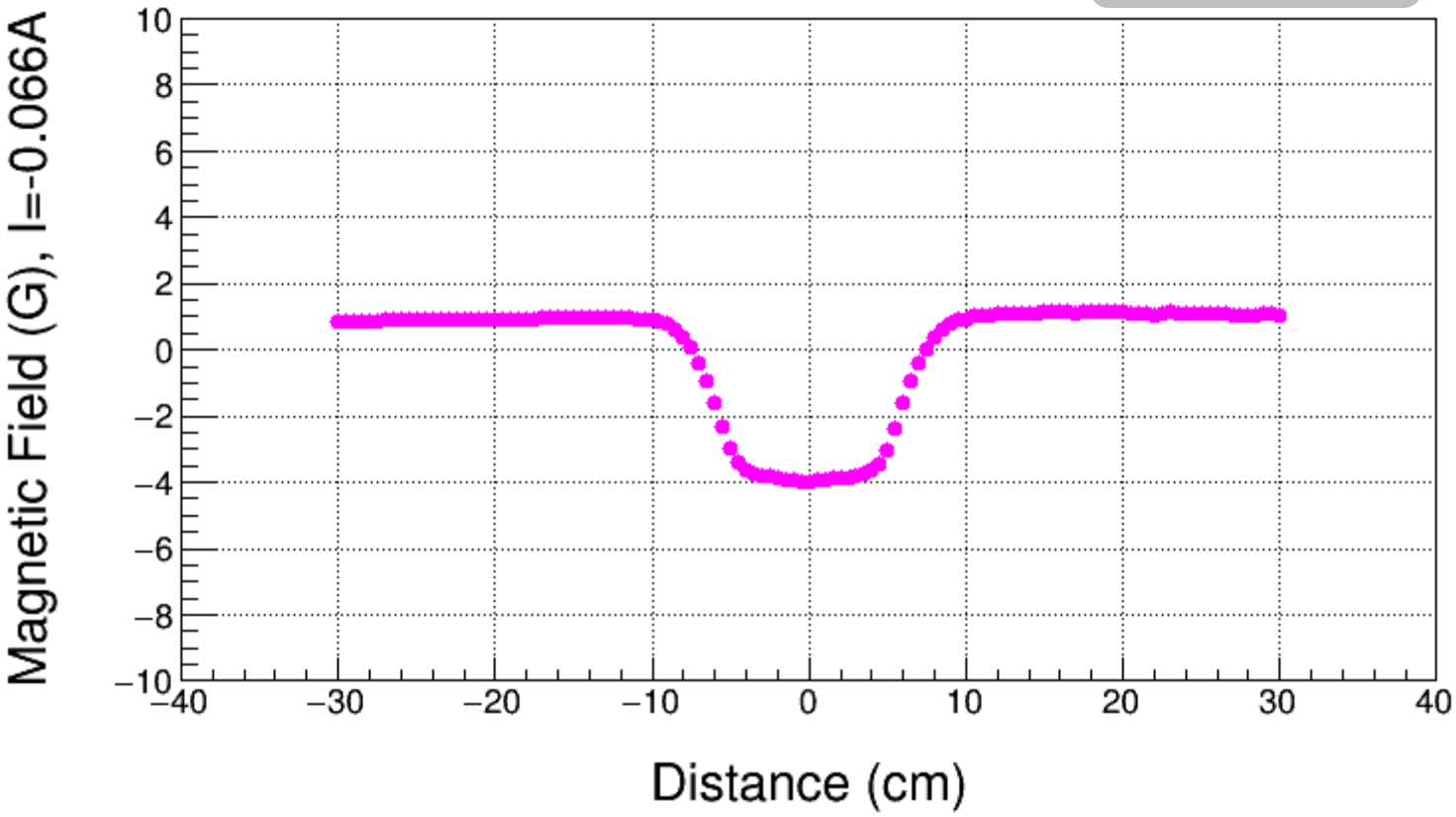
Field Map, I=-0.009A

On Hysteresis



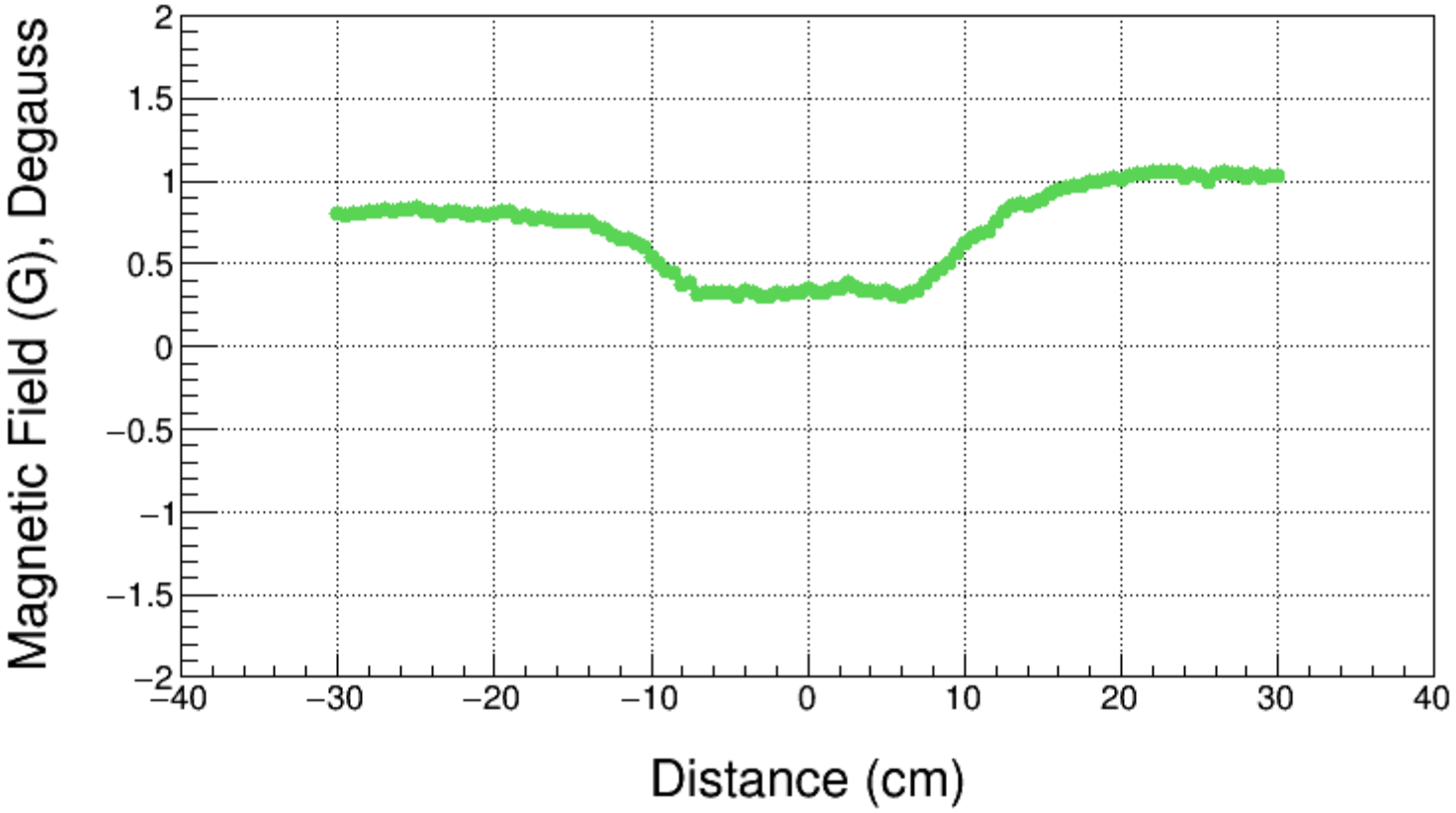
0 BdL, I=-0.066A

On Hysteresis



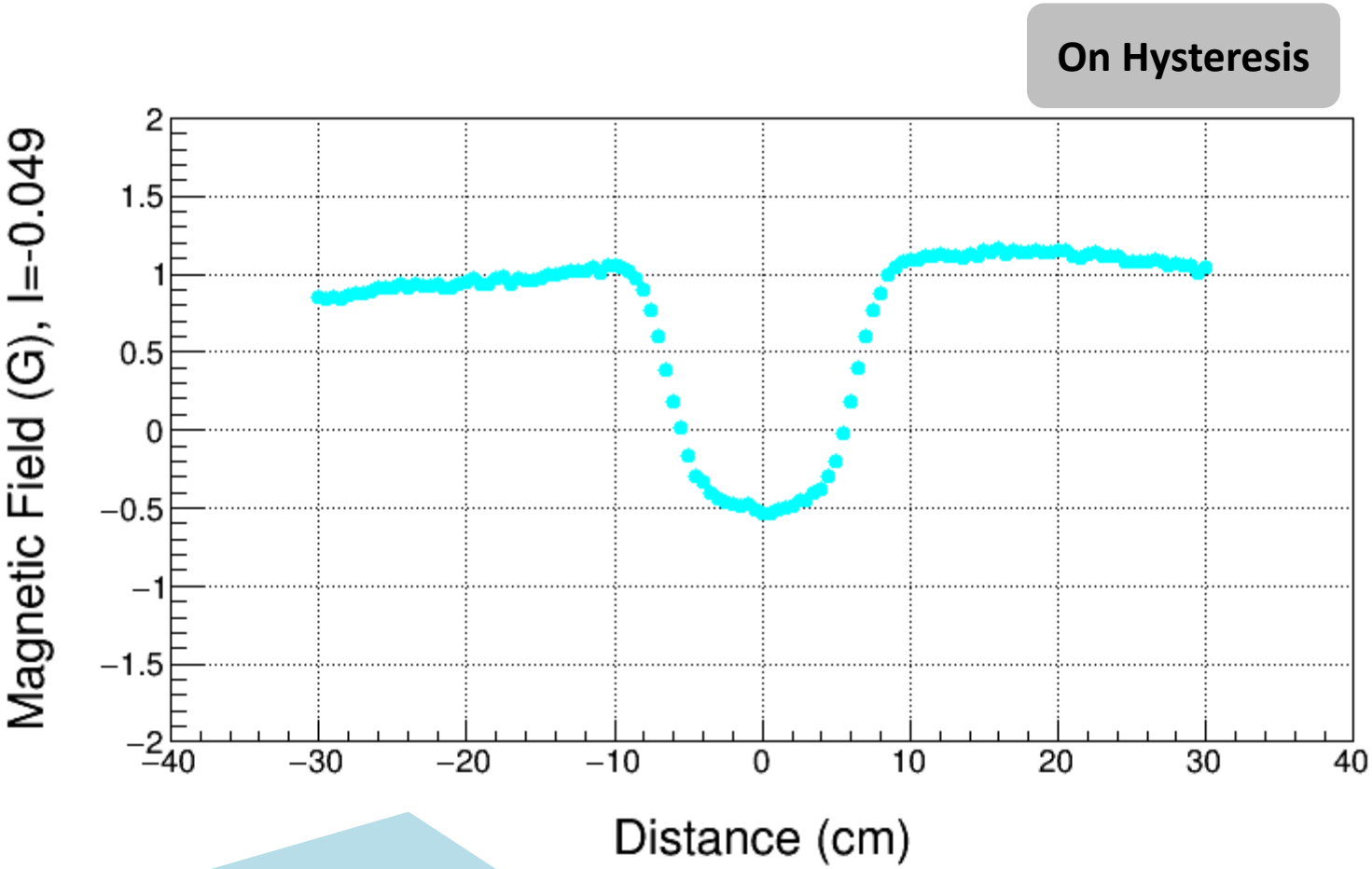
Used Field Map to find 0 BdL

Degaussed, Power Supply OFF



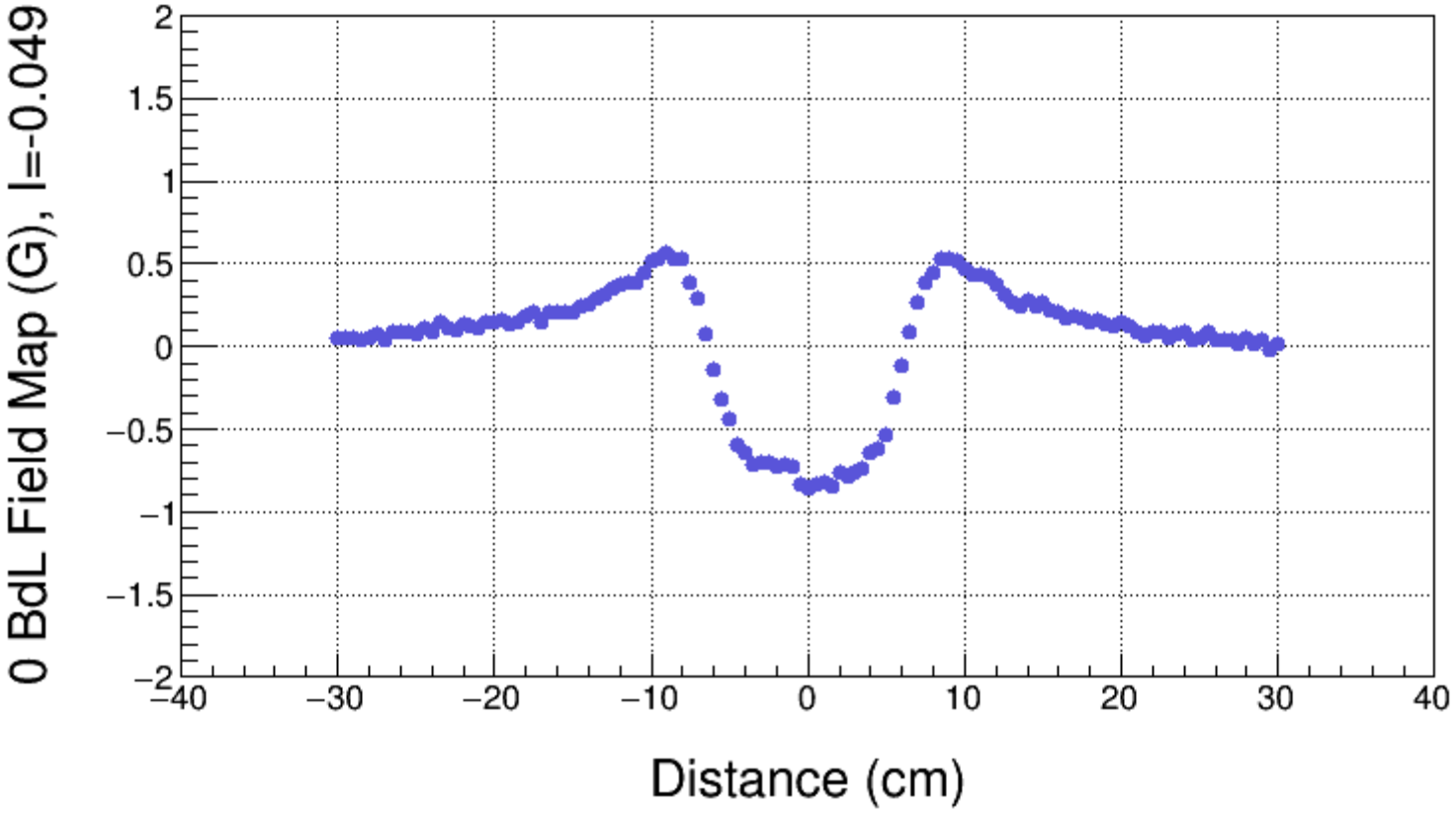
BdL = 42 G-cm, this is Field Map Offset

0 BdL, I=-0.049A (with no Offset)



Used Field Map with offset subtracted to find 0 BdL

BdL = 43 G-cm – Offset ~ 0



True 0 BdL Field Map

Summary - I

I. Field Map Offset is found by mapping degaussed magnet with power supply off

II. Field Map Offset of Spare DL magnet = 42 G-cm

III. By comparing Spare magnet Field Map and Field Map of installed magnet, Offset of installed magnet is about 20±5 G-cm since environmental fields at MMF higher are today (~1 G) than during mapping of magnet installed in CEBAF (~0.5 G) in August 2014

IV. Request to modify CEBAF Field Map: Subtract 20 G-cm

V. When mapping environmental fields in CEBAF Injector, DL magnet must be degaussed first

Summary - II

VI. For Beam Energy Measurement:

I. CEBAF : BdL ≠ 0 (due to field map error). Instead: BdL = -Offset ~ -20 G-cm (treat as another horizontal corrector)

II. Spectrometer Lines (2D, 3D, 5D): subtract 20 G-cm from Field Map

	Error
Trim Power Supply	2 mA
Magnet Model (to find momentum from field map)	0.1%
Field Map Offset	5 G-cm

For Mott Energy Measurements