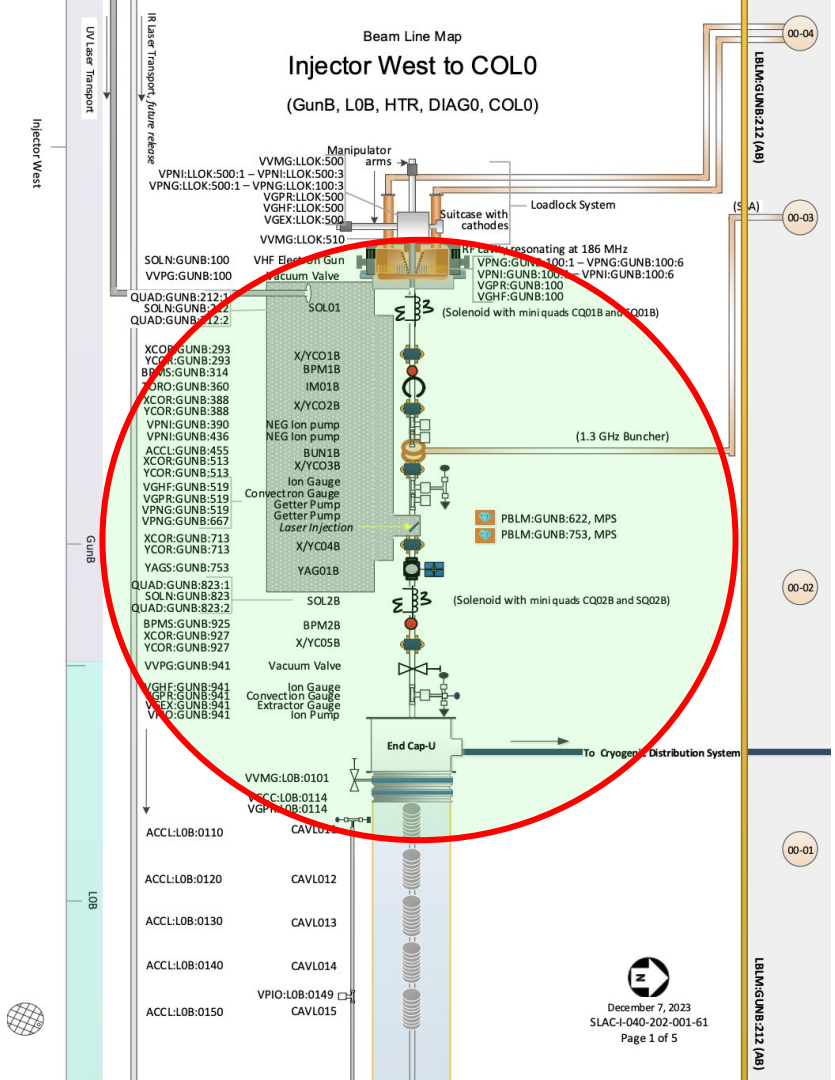
# SULI HOM vs. Correcting Magnet Plots

Jonathon Tordilla
2024/08/01

# Beamline Map


Beam Line Map
Injector West to COL0
(GunB, L0B, HTR, DIAG0, COL0)
UV Laser Transport
IR Laser Transport, future release
Injector West
GunB
L0B
00-04
00-03
00-02
00-01
LBLM:GUNB:212 (AB)
LBLM:GUNB:212 (AB)
Manipulator arms
VVMG:LLOK:500
VPNI:LLOK:500:1 – VPNI:LLOK:500:3
VPNG:LLOK:500:1 – VPNG:LLOK:100:3
VGPR:LLOK:500
VGHF:LLOK:500
VGEX:LLOK:500
VVMG:LLOK:510
Suitcase with cathodes
Loadlock System
(SLAC)
SOLN:GUNB:100
VVPG:GUNB:100
VHF Electron Gun
Vacuum Valve
IR Cavity resonating at 186 MHz
VPNG:GUNB:100:1 – VPNG:GUNB:100:6
VPNI:GUNB:100:1 – VPNI:GUNB:100:6
VGPR:GUNB:100
VGHF:GUNB:100
QUAD:GUNB:212:1
SOLN:GUNB:212
QUAD:GUNB:212:2
SOL01
(Solenoid with mini quads CQ01B and SQ01B)
XCOR:GUNB:293
YCOR:GUNB:293
BPMS:GUNB:314
TORO:GUNB:360
XCOR:GUNB:388
YCOR:GUNB:388
VPNI:GUNB:390
VPNI:GUNB:436
ACCL:GUNB:455
XCOR:GUNB:513
YCOR:GUNB:513
VGHF:GUNB:519
VGPR:GUNB:519
VPNG:GUNB:519
VPNG:GUNB:667
X/YCO1B
BPM1B
IM01B
X/YCO2B
NEG Ion pump
NEG Ion pump
BUN1B
X/YCO3B
Ion Gauge
Convectron Gauge
Getter Pump
Getter Pump
Laser Injection
(1.3 GHz Buncher)
PBLM:GUNB:622, MPS
PBLM:GUNB:753, MPS
XCOR:GUNB:713
YCOR:GUNB:713
YAGS:GUNB:753
X/YC04B
YAG01B
QUAD:GUNB:823:1
SOLN:GUNB:823
QUAD:GUNB:823:2
SOL2B
(Solenoid with mini quads CQ02B and SQ02B)
BPMS:GUNB:925
XCOR:GUNB:927
YCOR:GUNB:927
BPM2B
X/YC05B
VVPG:GUNB:941
Vacuum Valve
VGHF:GUNB:941
VGPR:GUNB:941
VGEX:GUNB:941
VPIO:GUNB:941
Ion Gauge
Convection Gauge
Extractor Gauge
Ion Pump
End Cap-U
To Cryogenic Distribution System
VVMG:L0B:0101
VSCC:L0B:0114
VGPR:L0B:0114
ACCL:L0B:0110
CAVL011
ACCL:L0B:0120
CAVL012
ACCL:L0B:0130
CAVL013
ACCL:L0B:0140
CAVL014
VPIO:L0B:0149
ACCL:L0B:0150
CAVL015
December 7, 2023
SLAC-I-040-202-001-61
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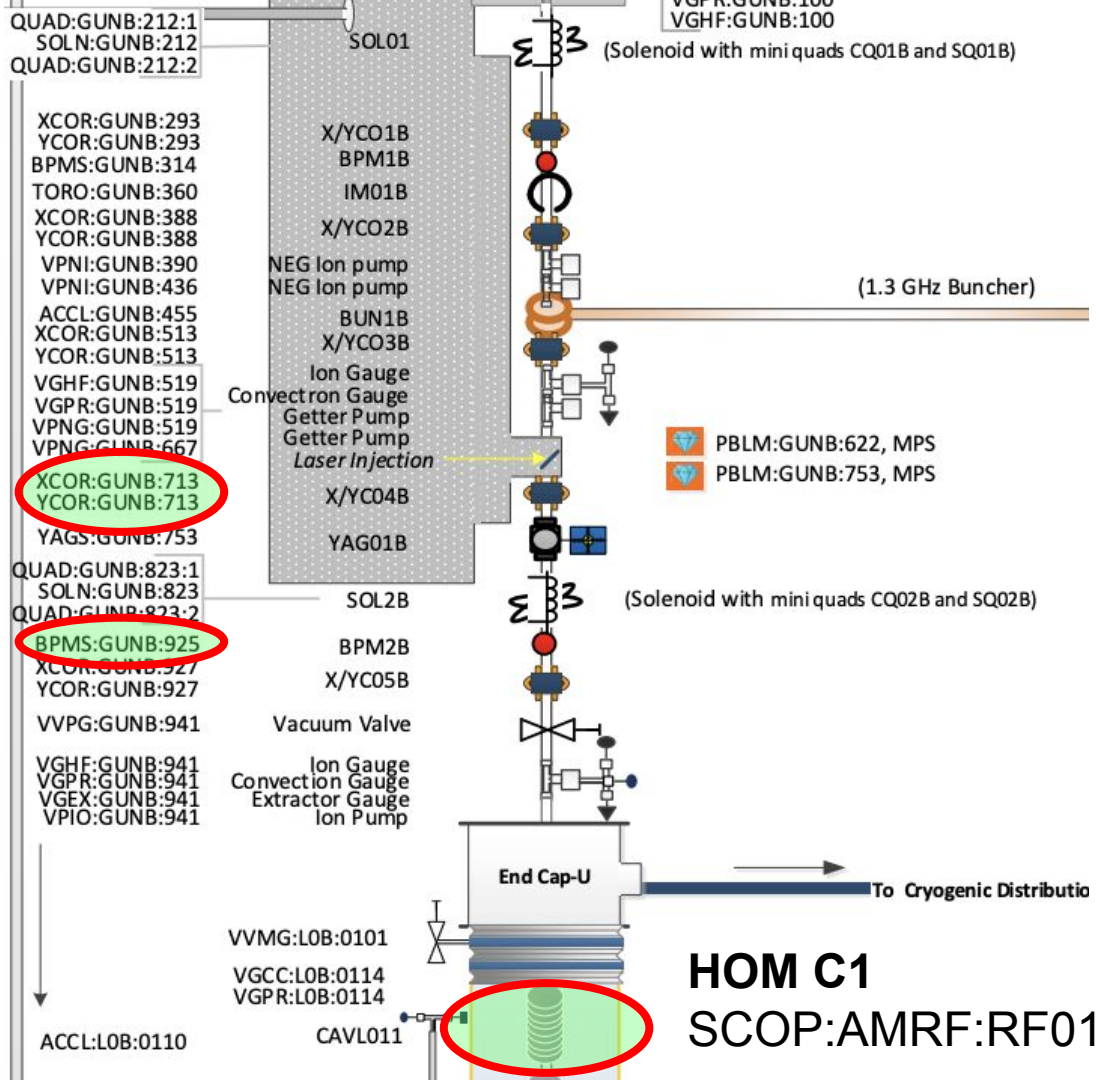


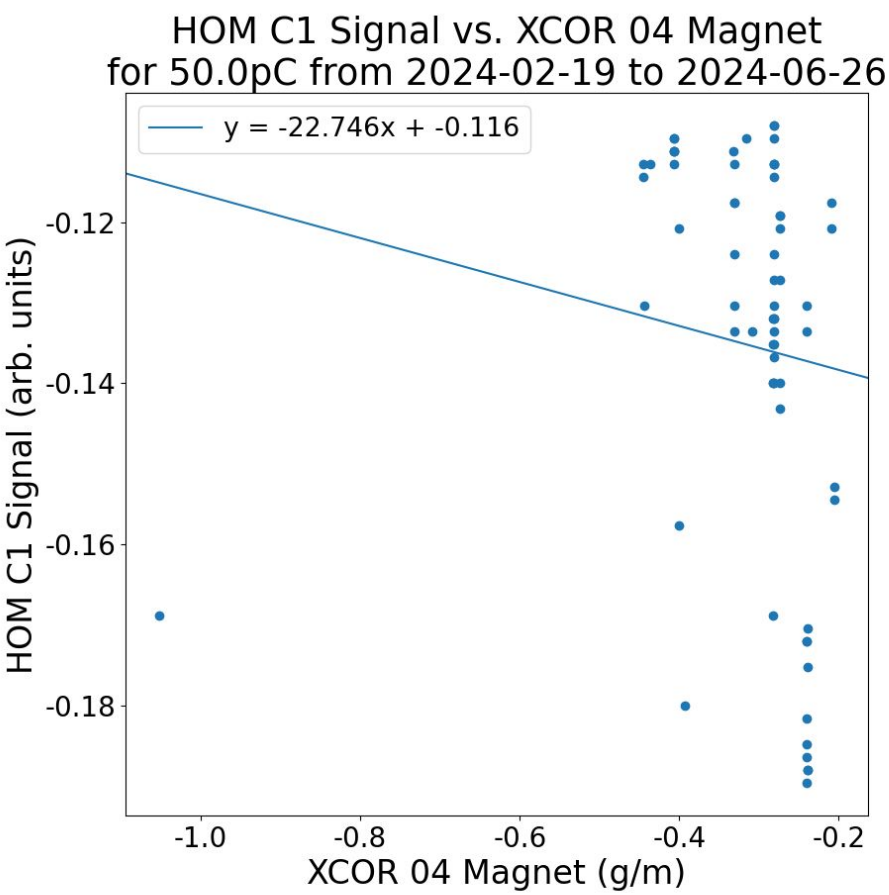

**HOM C1**

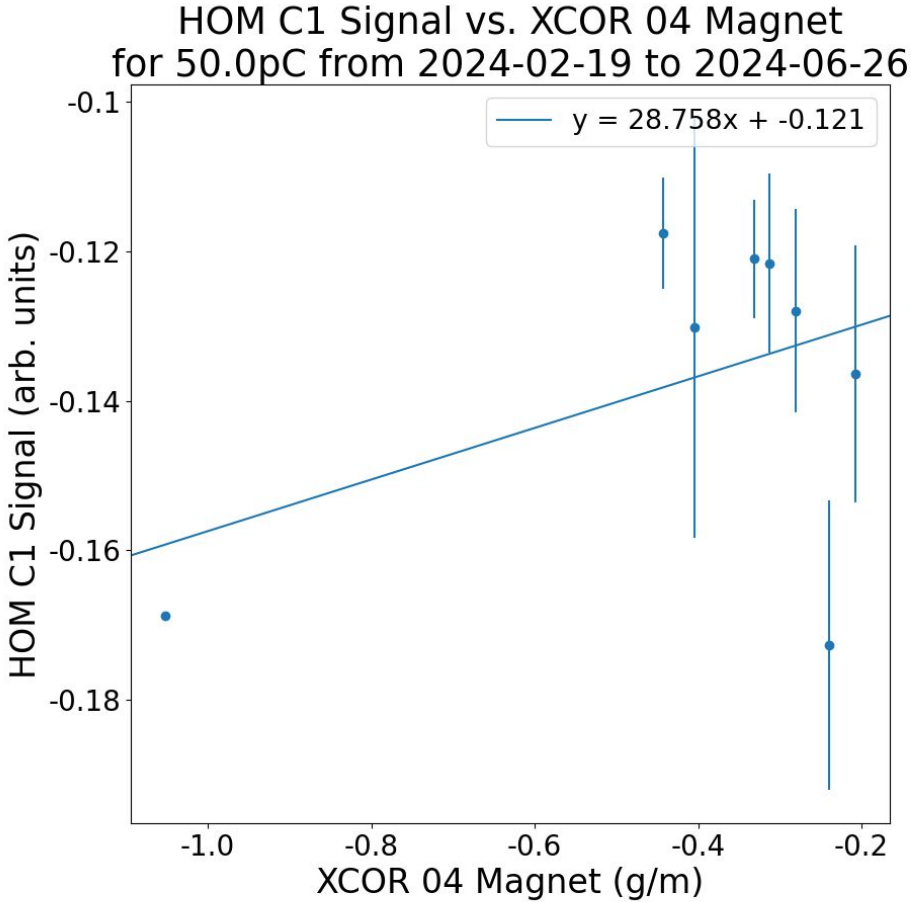
SCOP:AMRF:RF01:AI_MEAS1

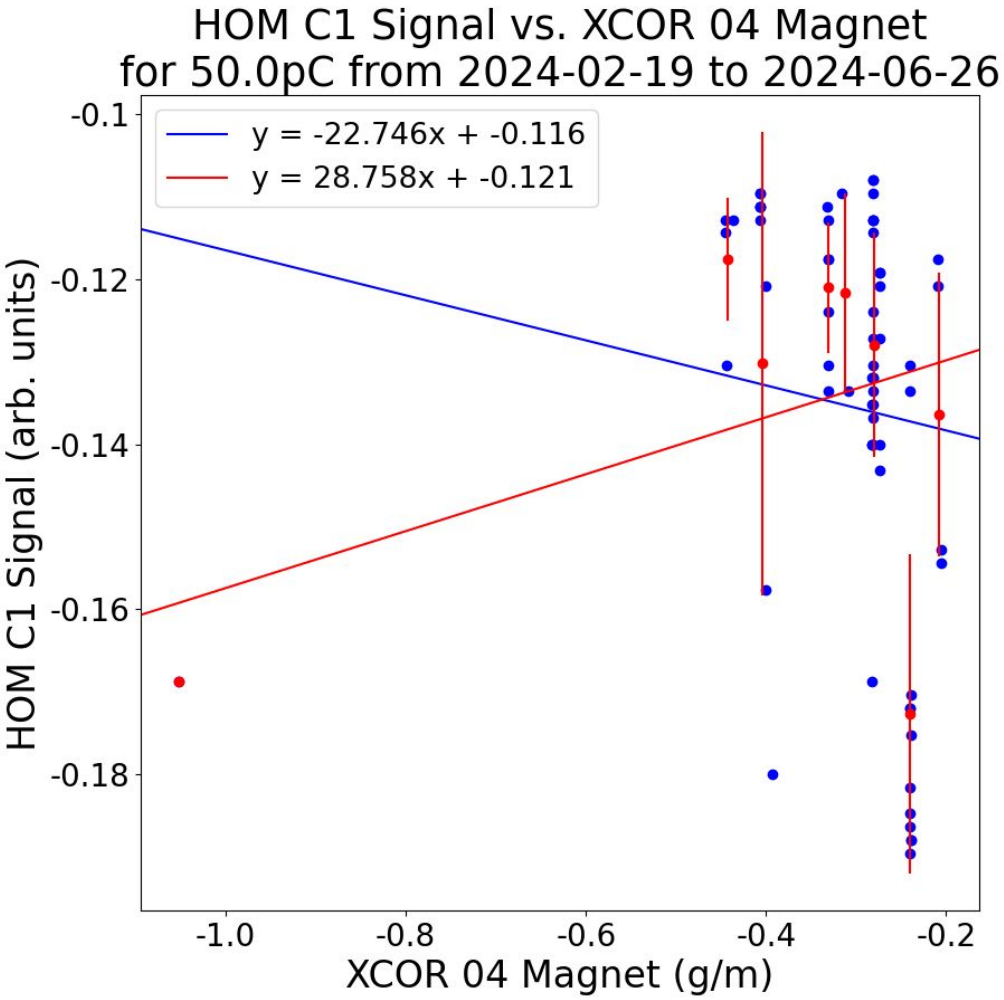
# Plots

1. Over a 6-month period
    a. XCOR 04
    b. BPMX 02
    c. YCOR 04
    d. BPMY 02
2. Injector Buncher Phase Scans (100 instances between March-July 2024)
    a. PVs Over Time
    b. XCOR 04
    c. BPMX 02
    d. YCOR 04
    e. BPMY 02

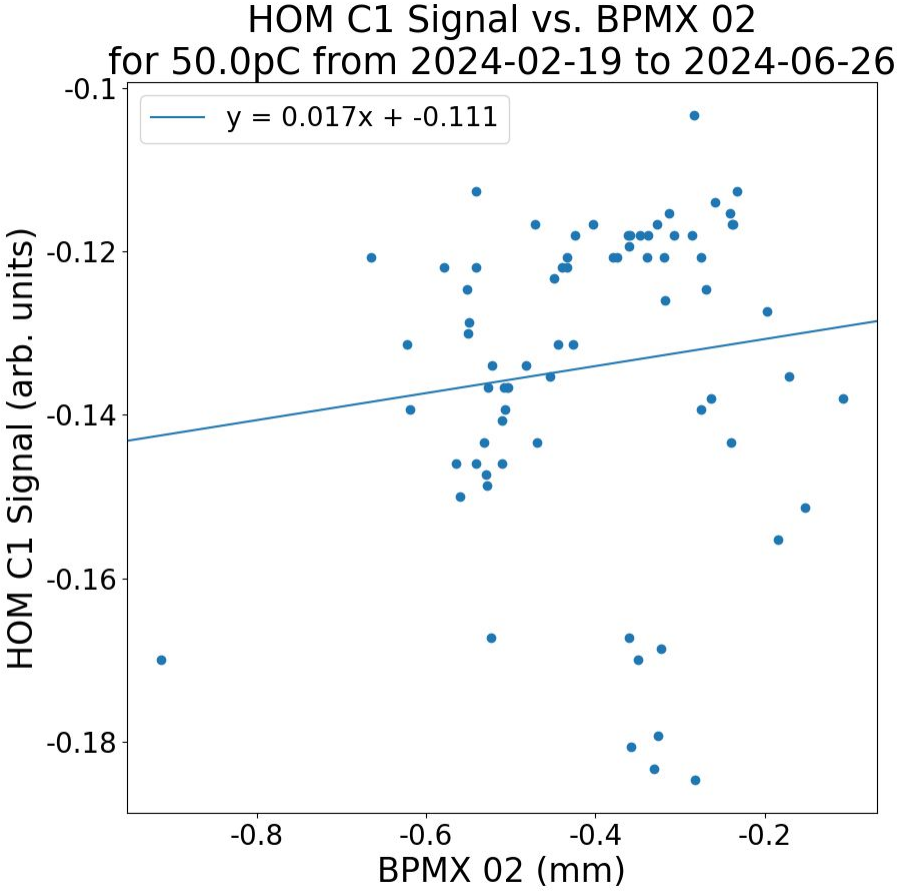
Over a 6-month period, XCOR

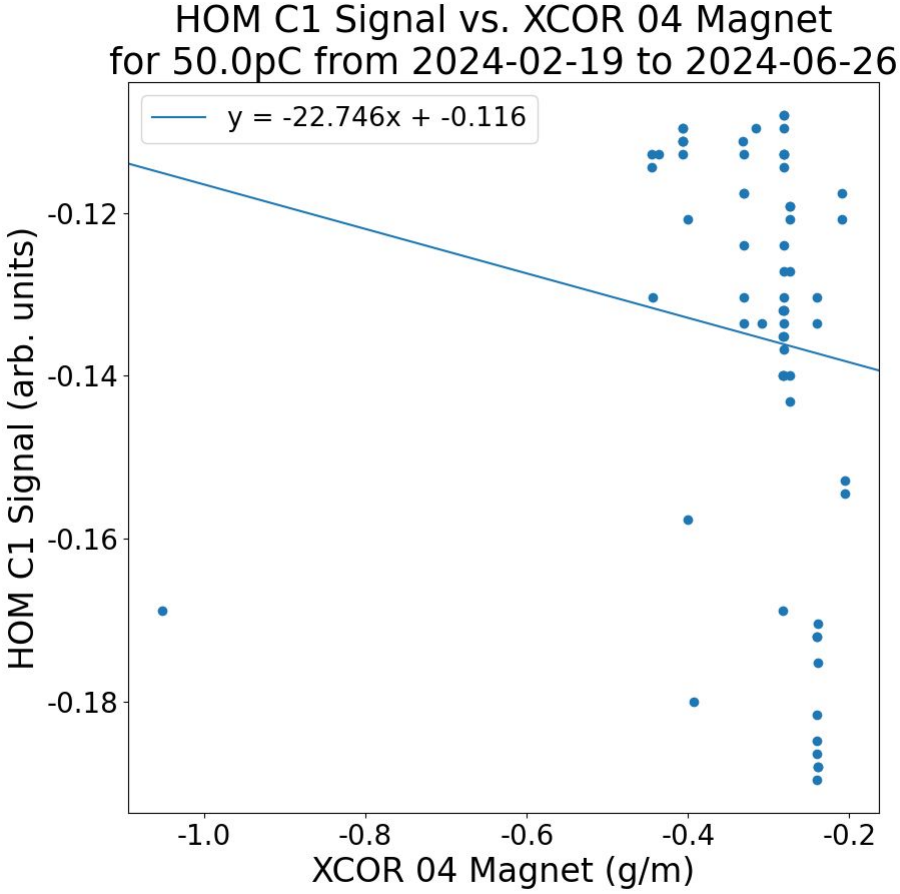

HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-02-19 to 2024-06-26
y = -22.746x + -0.116
HOM C1 Signal (arb. units)
-0.12
-0.14
-0.16
-0.18
-1.0
-0.8
-0.6
-0.4
-0.2
XCOR 04 Magnet (g/m)


HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-02-19 to 2024-06-26
y = 28.758x + -0.121
HOM C1 Signal (arb. units)
-0.1
-0.12
-0.14
-0.16
-0.18
-1.0
-0.8
-0.6
-0.4
-0.2
XCOR 04 Magnet (g/m)

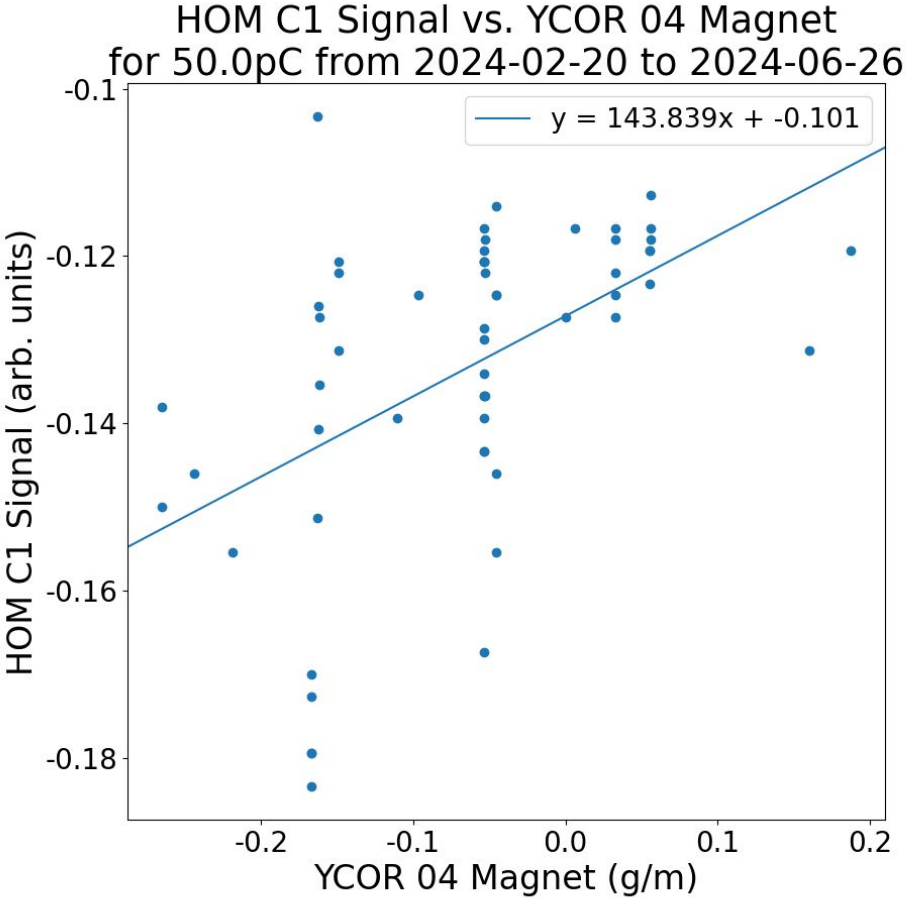

HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-02-19 to 2024-06-26
y = -22.746x + -0.116
y = 28.758x + -0.121
HOM C1 Signal (arb. units)
-0.1
-0.12
-0.14
-0.16
-0.18
-1.0
-0.8
-0.6
-0.4
-0.2
XCOR 04 Magnet (g/m)

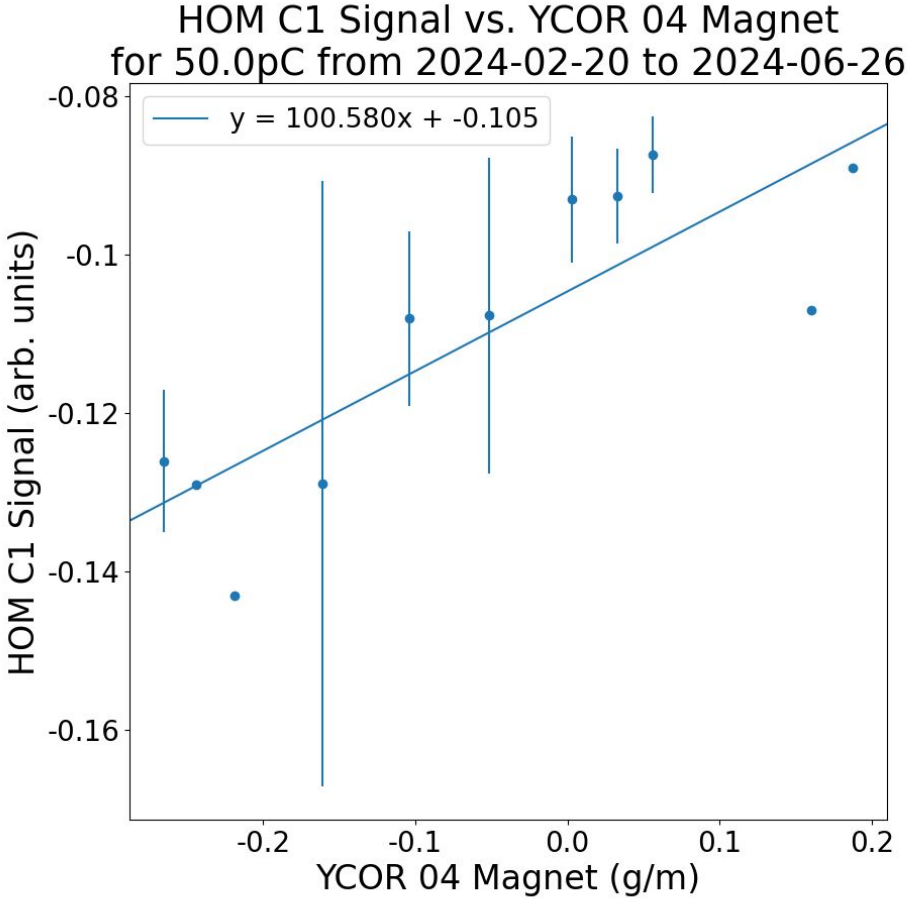
Over 6-month period, BPMX and XCOR

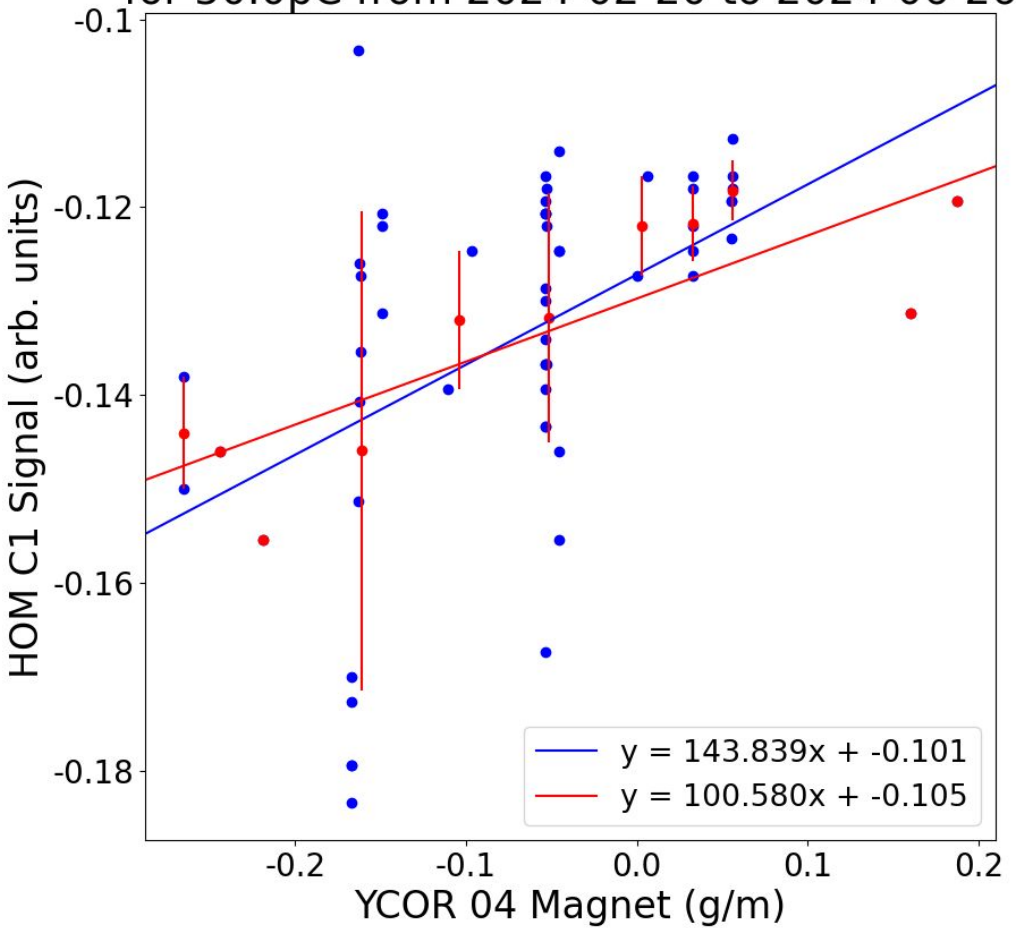

HOM C1 Signal vs. BPMX 02
for 50.0pC from 2024-02-19 to 2024-06-26
y = 0.017x + -0.111
HOM C1 Signal (arb. units)
-0.1
-0.12
-0.14
-0.16
-0.18
-0.8
-0.6
-0.4
-0.2
BPMX 02 (mm)


HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-02-19 to 2024-06-26
y = -22.746x + -0.116
HOM C1 Signal (arb. units)
-0.12
-0.14
-0.16
-0.18
-1.0
-0.8
-0.6
-0.4
-0.2
XCOR 04 Magnet (g/m)

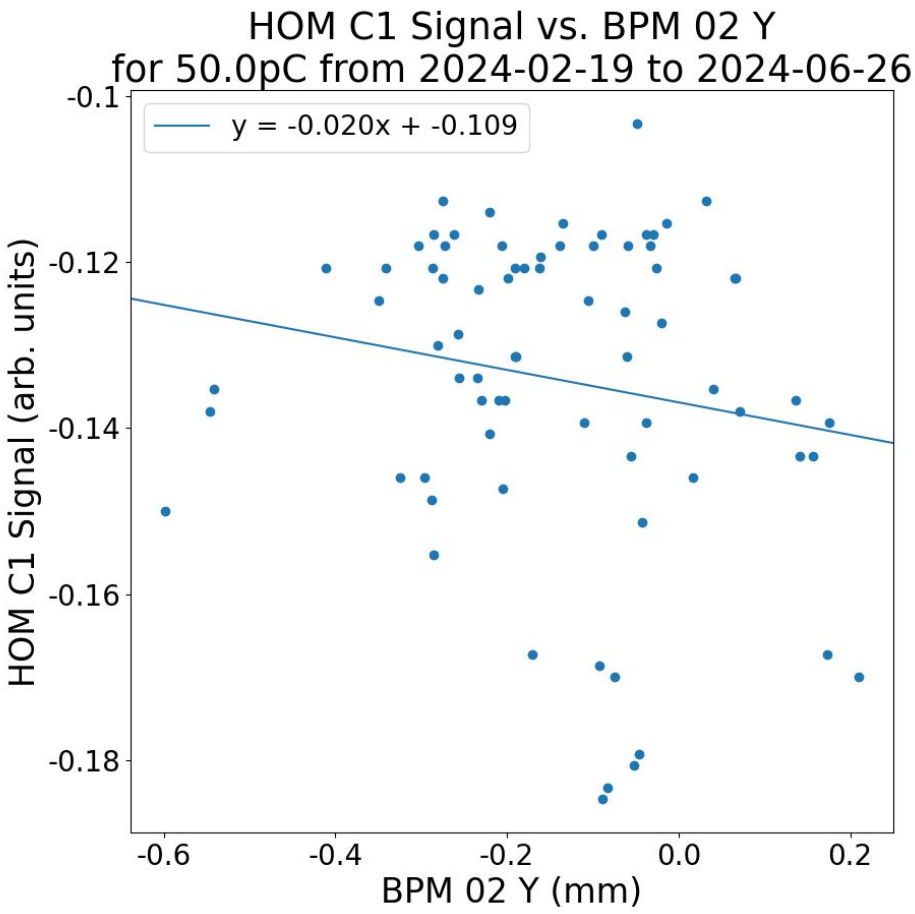
Over a 6-month period, YCOR

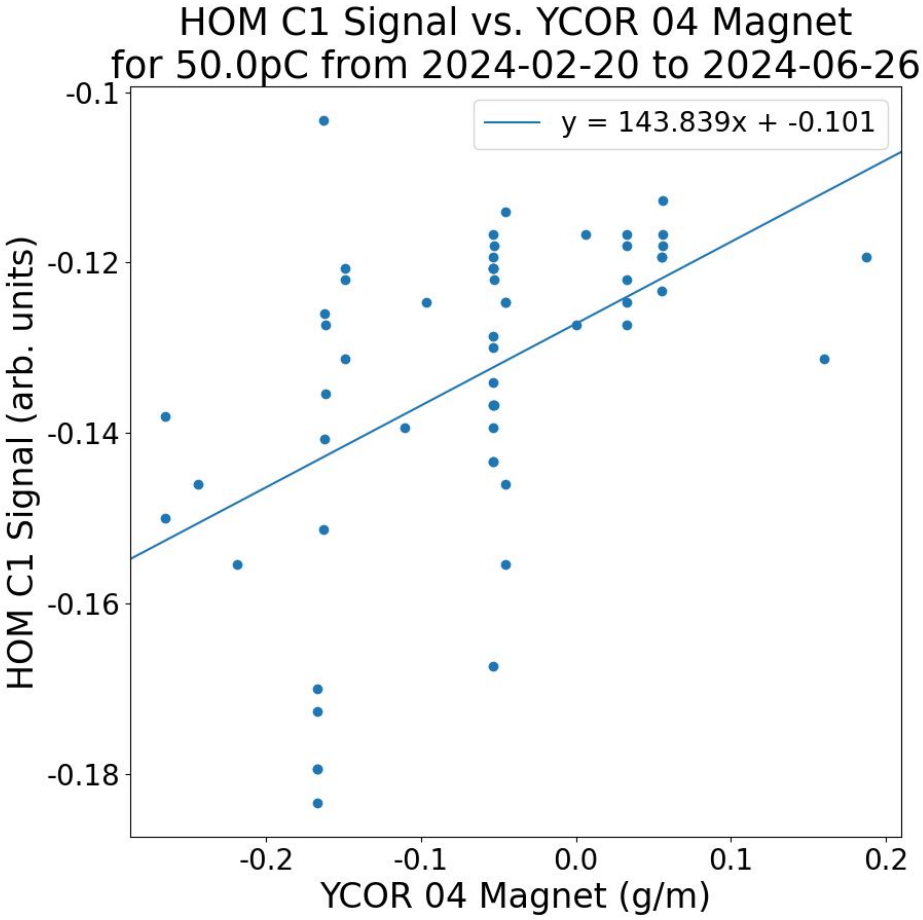

HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-02-20 to 2024-06-26
y = 143.839x + -0.101
HOM C1 Signal (arb. units)
YCOR 04 Magnet (g/m)
-0.1
-0.12
-0.14
-0.16
-0.18
-0.2
-0.1
0.0
0.1
0.2


HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-02-20 to 2024-06-26
y = 100.580x + -0.105
HOM C1 Signal (arb. units)
YCOR 04 Magnet (g/m)
-0.08
-0.1
-0.12
-0.14
-0.16
-0.2
-0.1
0.0
0.1
0.2

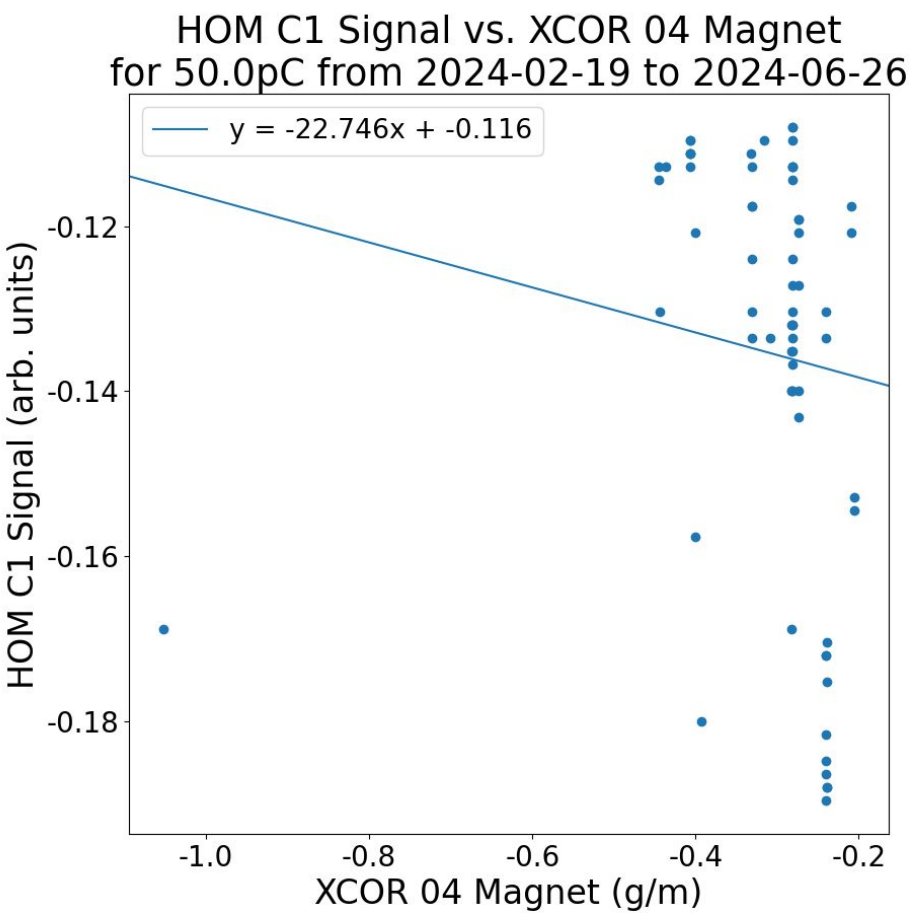

HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-02-20 to 2024-06-26
HOM C1 Signal (arb. units)
YCOR 04 Magnet (g/m)
-0.1
-0.12
-0.14
-0.16
-0.18
-0.2
-0.1
0.0
0.1
0.2
y = 143.839x + -0.101
y = 100.580x + -0.105

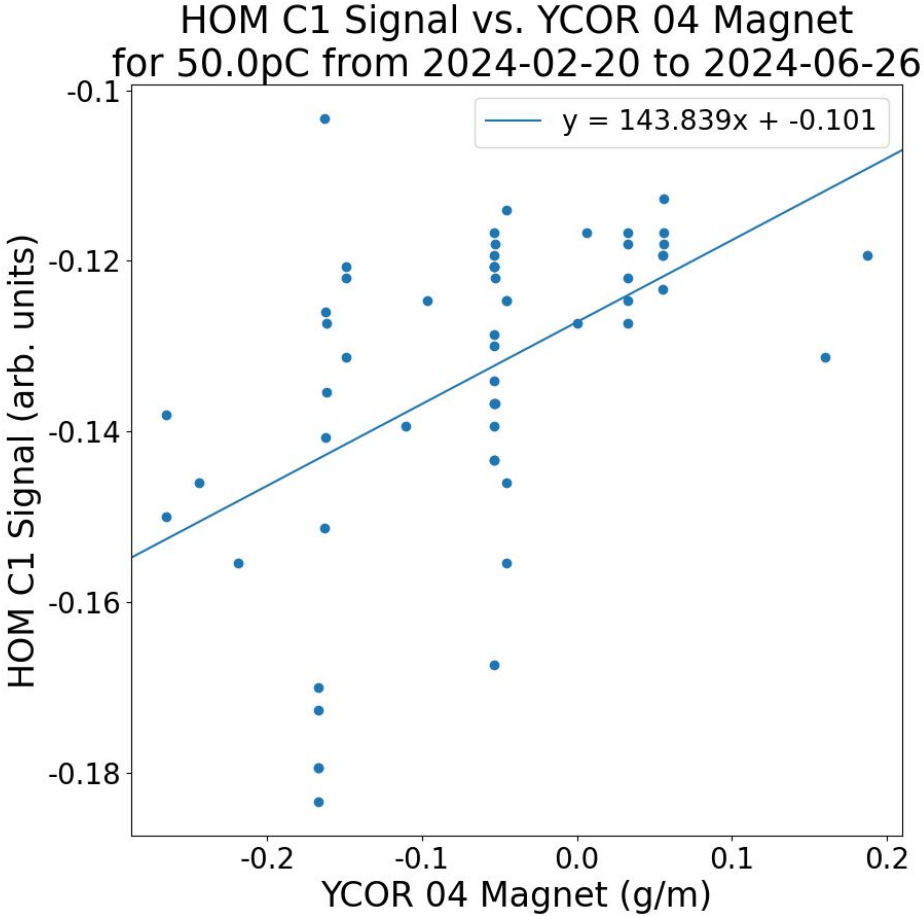
Over 6-month period, BPMY and YCOR


HOM C1 Signal vs. BPM 02 Y
for 50.0pC from 2024-02-19 to 2024-06-26
y = -0.020x + -0.109
HOM C1 Signal (arb. units)
BPM 02 Y (mm)
-0.1
-0.12
-0.14
-0.16
-0.18
-0.6
-0.4
-0.2
0.0
0.2


HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-02-20 to 2024-06-26
y = 143.839x + -0.101
HOM C1 Signal (arb. units)
YCOR 04 Magnet (g/m)
-0.1
-0.12
-0.14
-0.16
-0.18
-0.2
-0.1
0.0
0.1
0.2

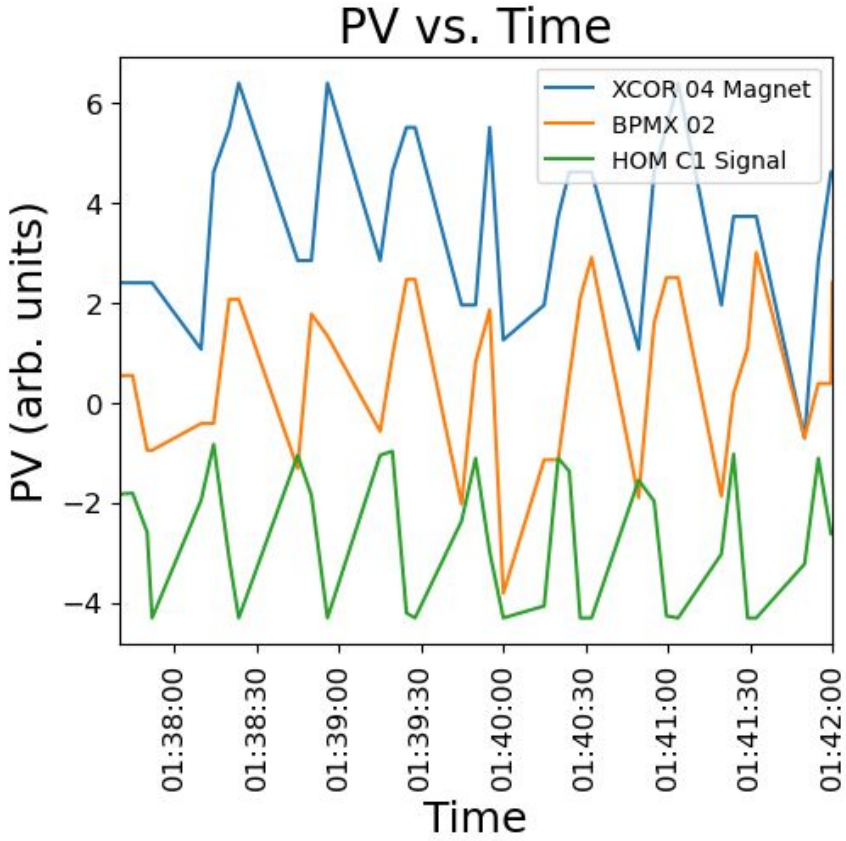
Over 6 month period, XCOR and YCOR

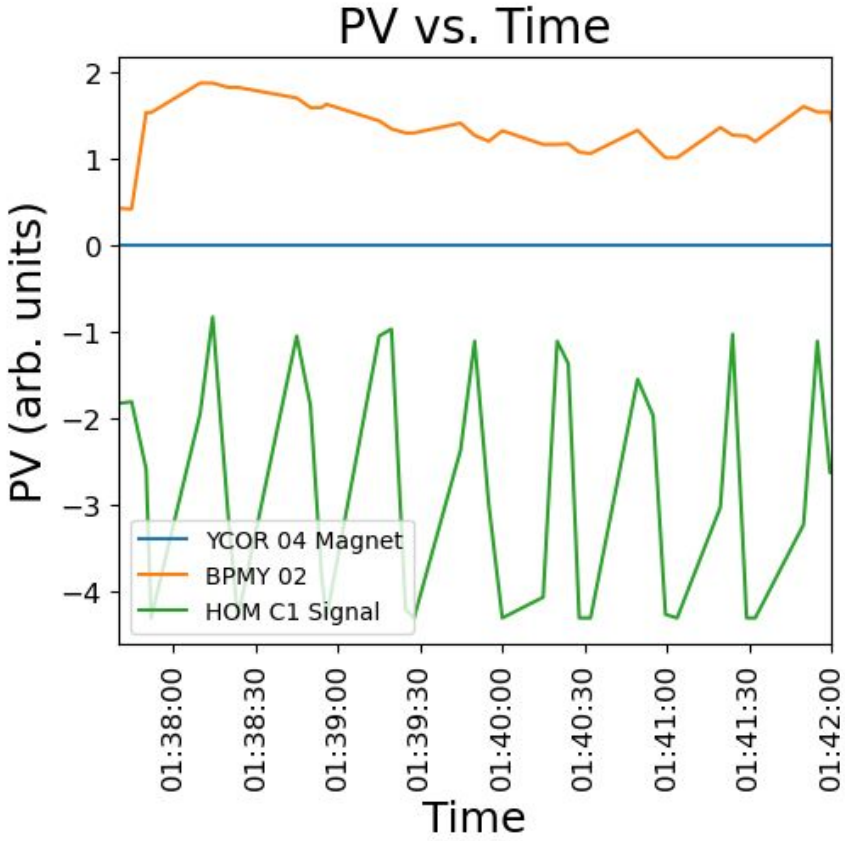

HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-02-19 to 2024-06-26
y = -22.746x + -0.116
HOM C1 Signal (arb. units)
-0.12
-0.14
-0.16
-0.18
-1.0
-0.8
-0.6
-0.4
-0.2
XCOR 04 Magnet (g/m)


HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-02-20 to 2024-06-26
y = 143.839x + -0.101
HOM C1 Signal (arb. units)
-0.1
-0.12
-0.14
-0.16
-0.18
-0.2
-0.1
0.0
0.1
0.2
YCOR 04 Magnet (g/m)

# During Injector Buncher Phase Scans

2024/07/02 01:38:00 → 2024/07/02 01:42:00



# Note:

Downloaded the web page

Scraped for all the logbook entries

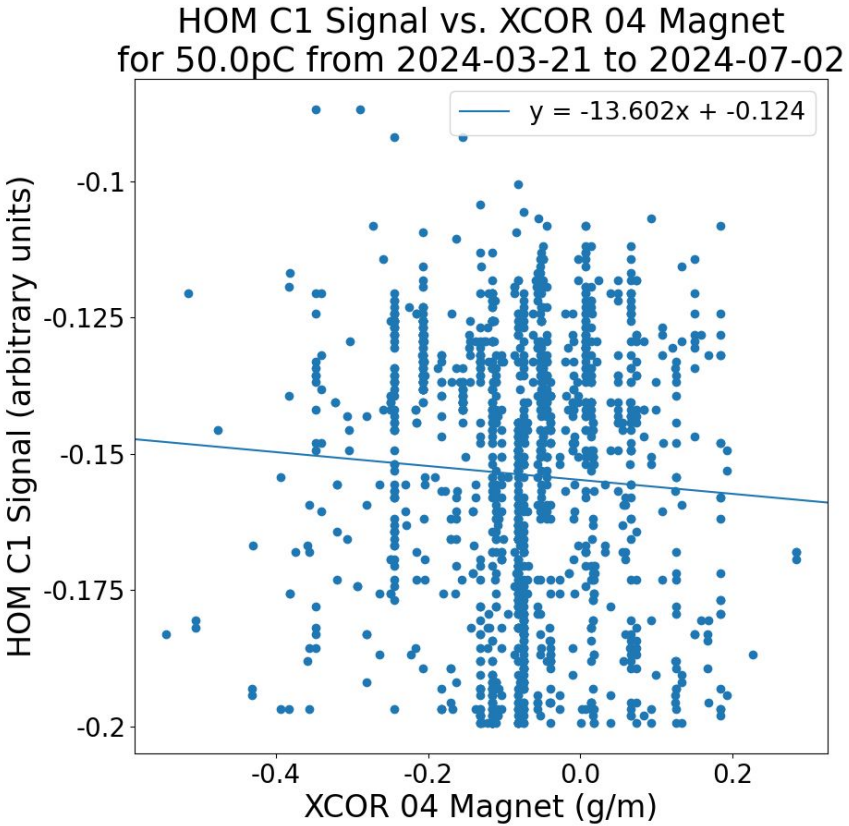
Got **100** different 10 minute timeframes

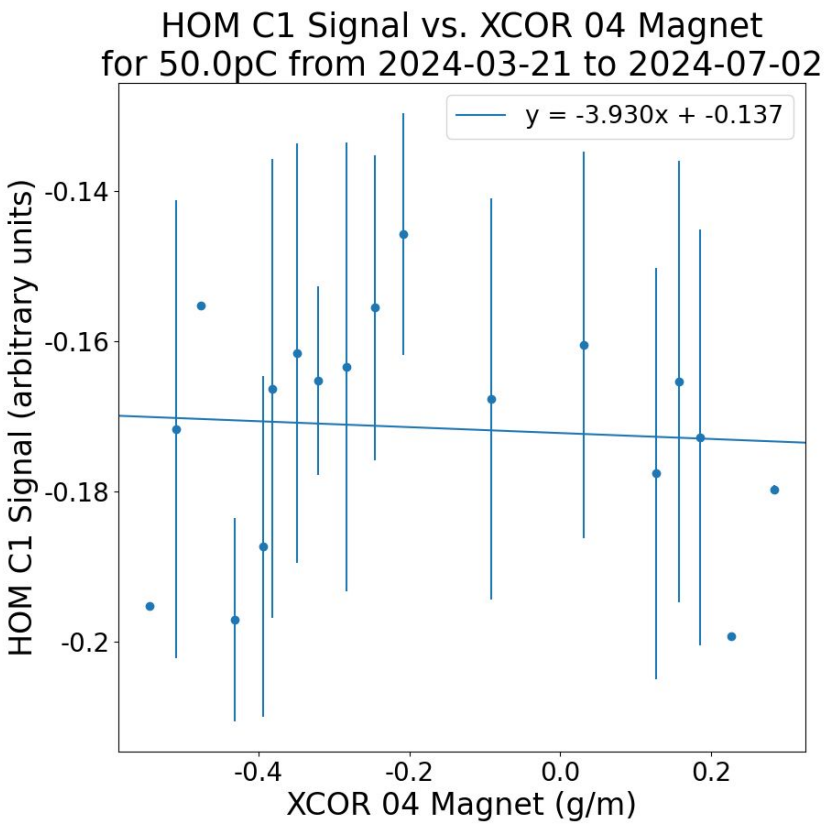
Merged all the DataFrames together

Separated by charge and plotted correlations

# XCOR Phase Scans

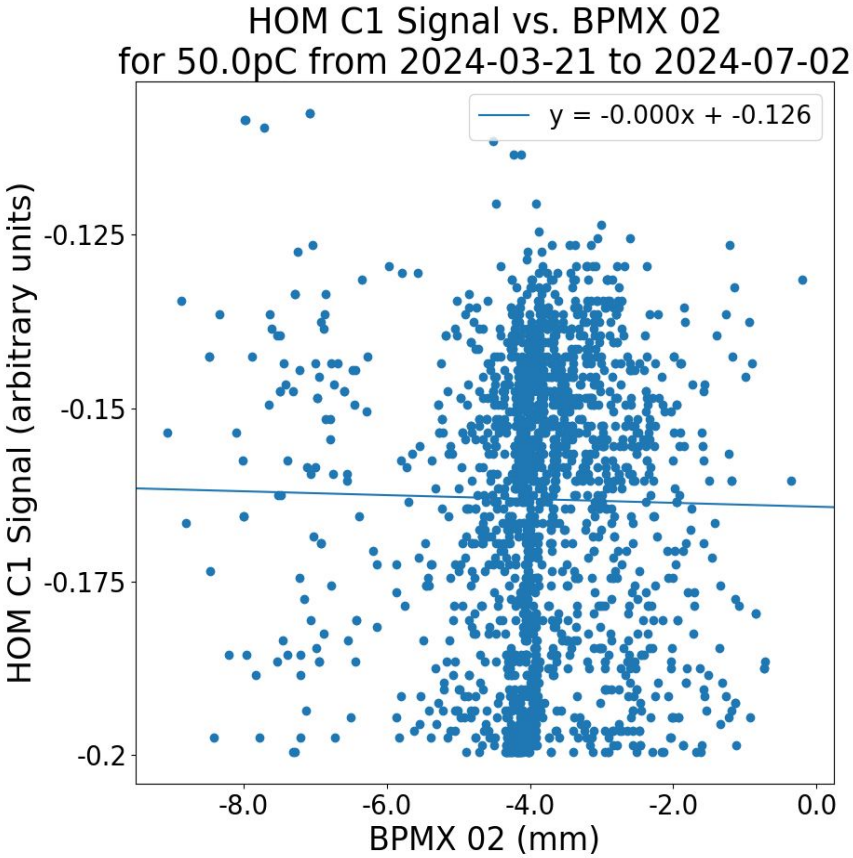
# Phase Scans from 2024

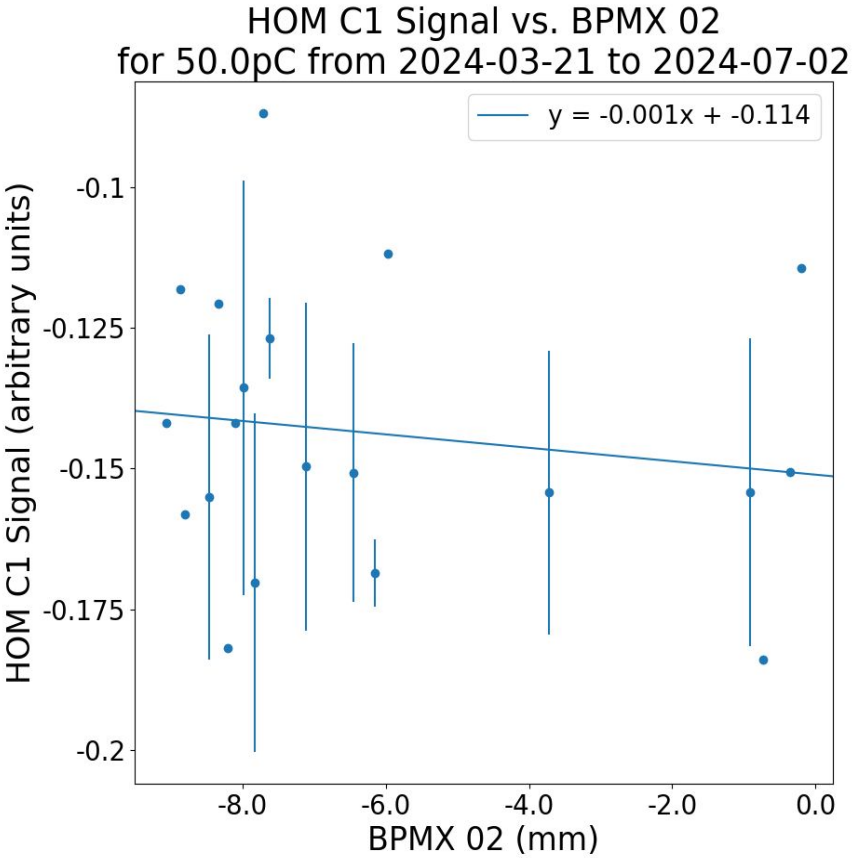


# BPMX Phase Scans

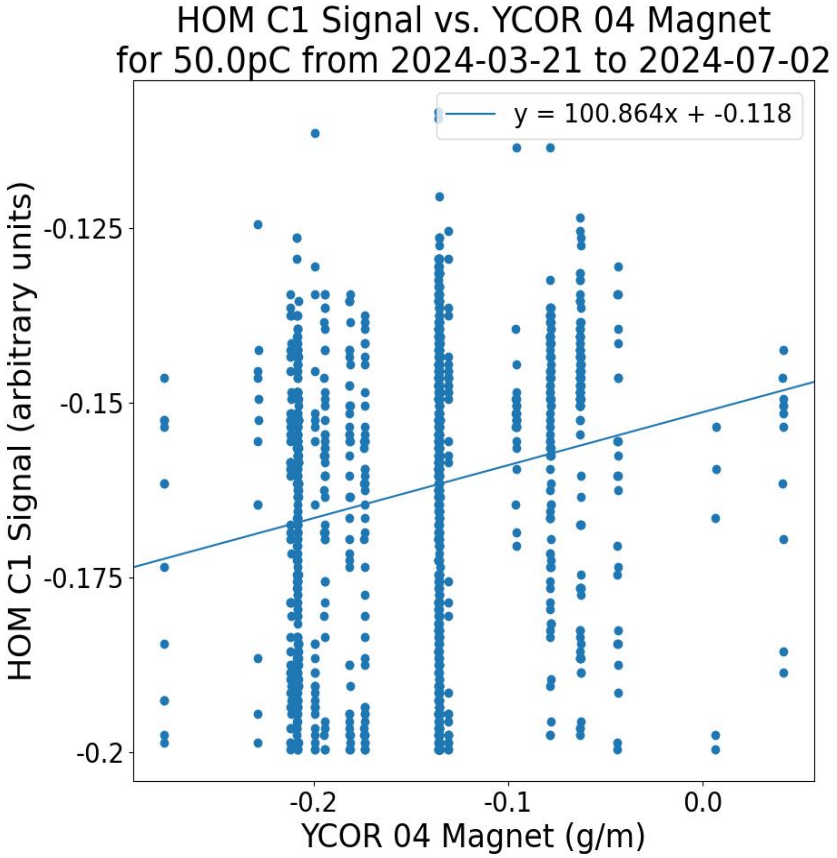
# Phase Scans from 2024

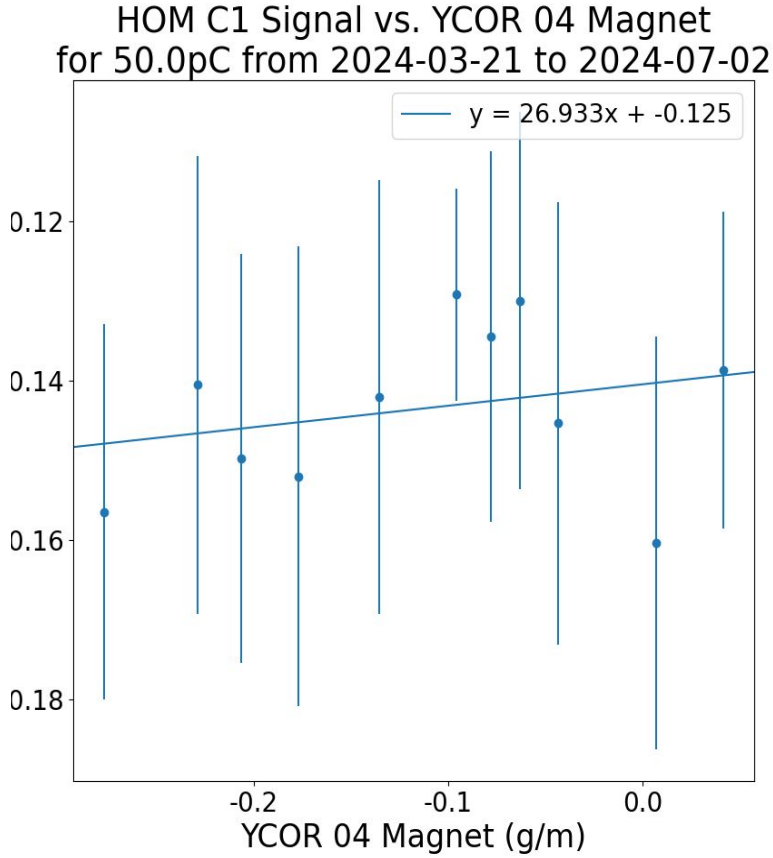


# YCOR Phase Scans

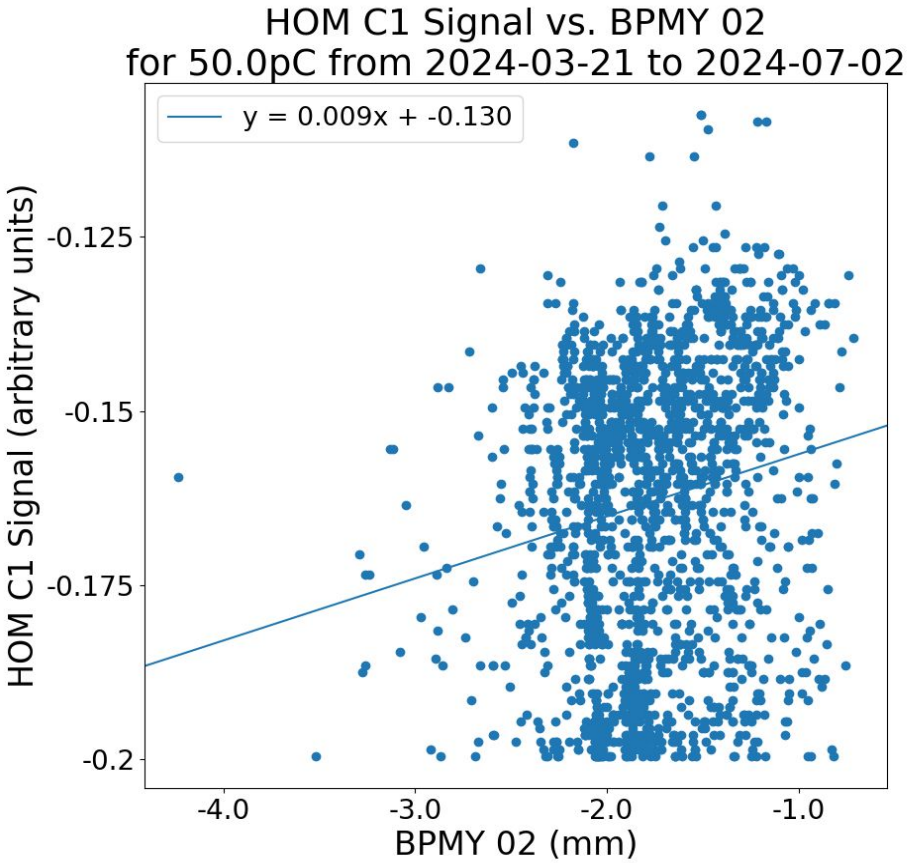
# Phase Scans from 2024

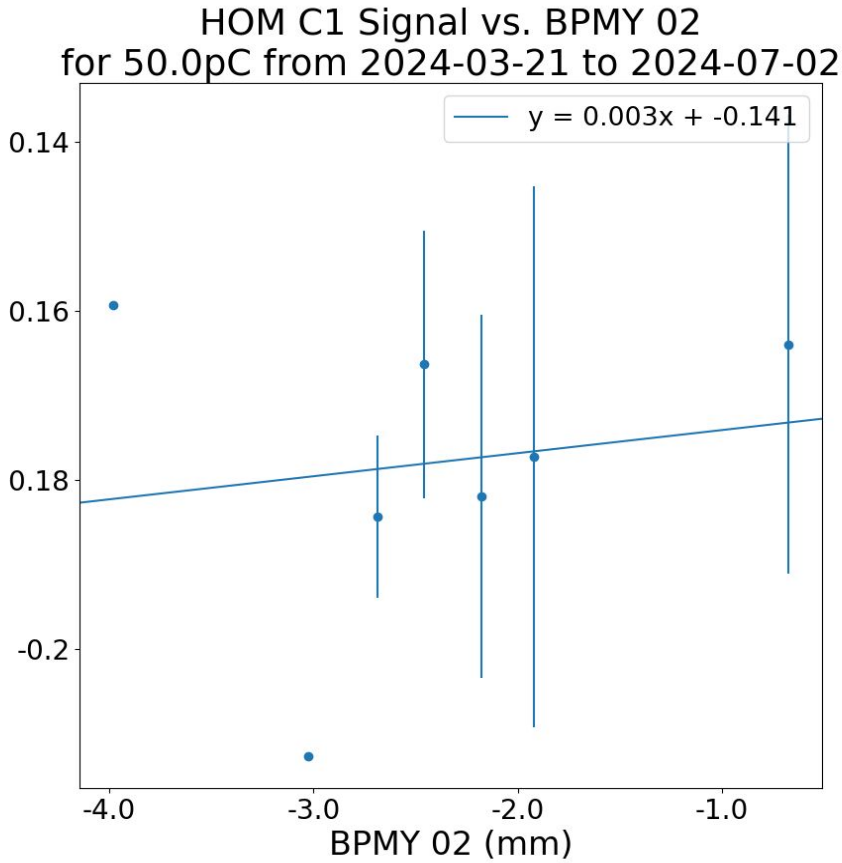


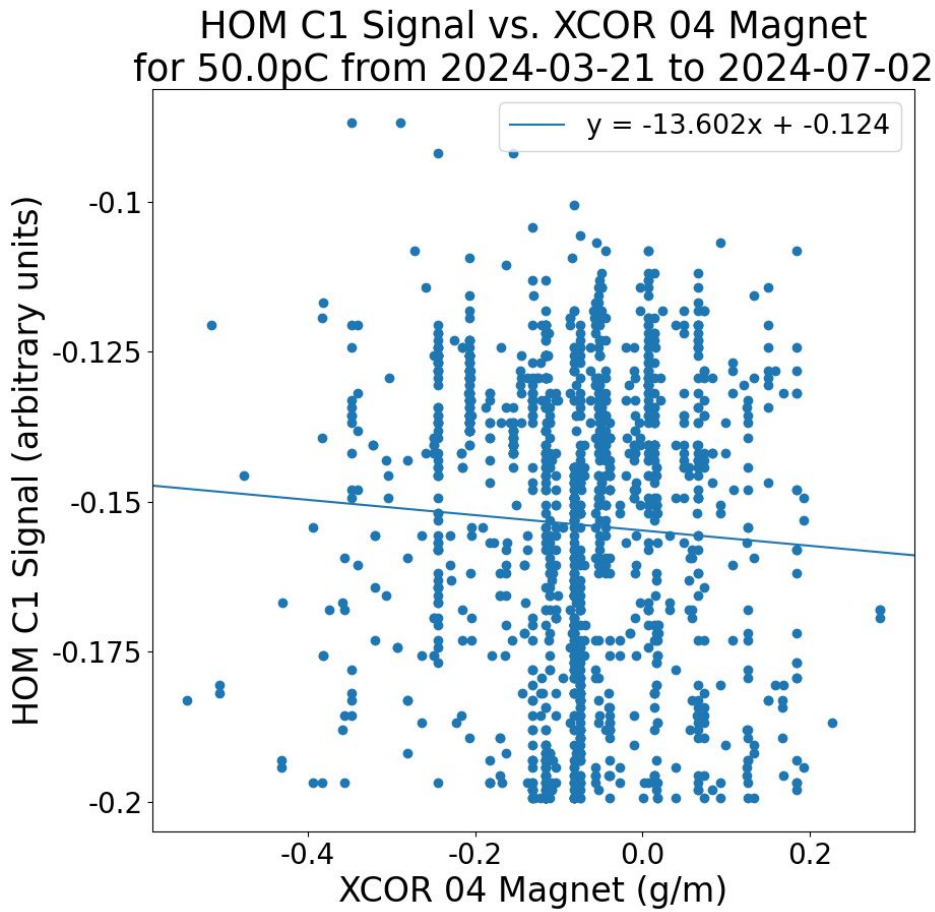
# BPMY Phase Scans

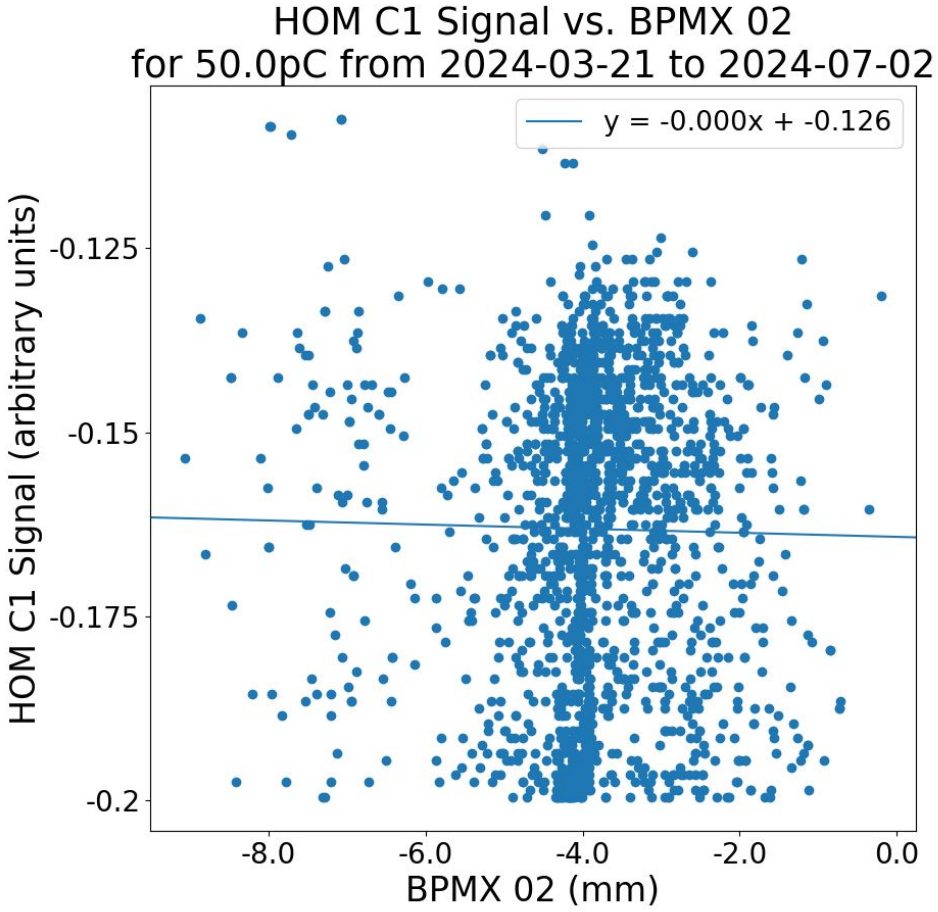
# Phase Scans from 2024

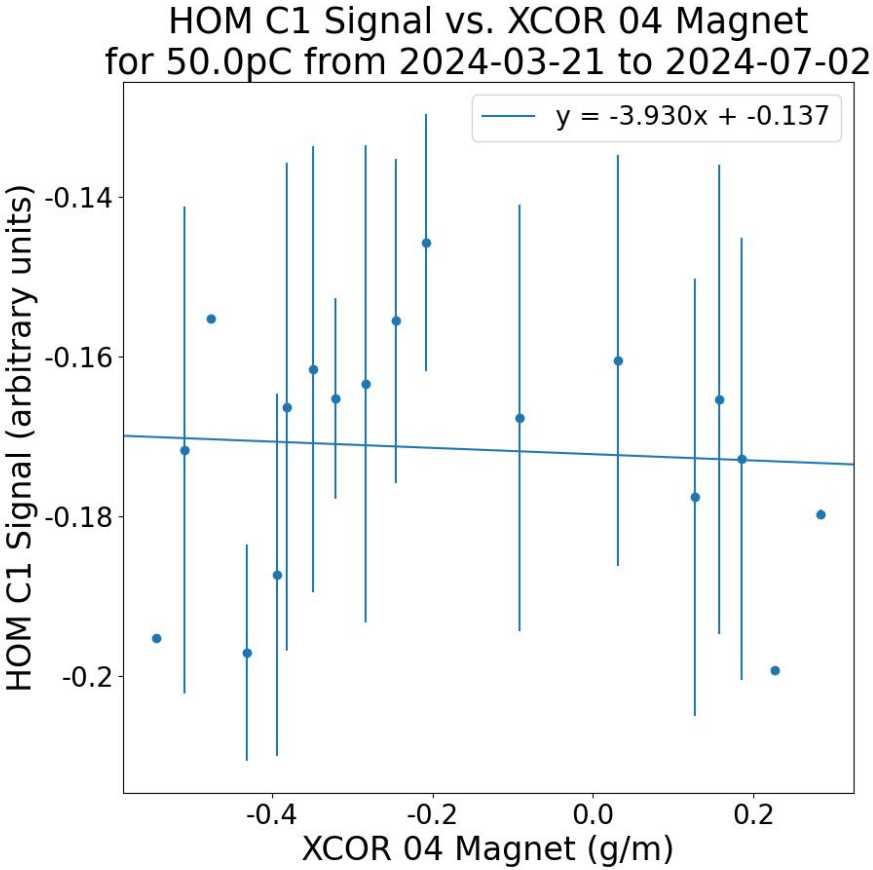


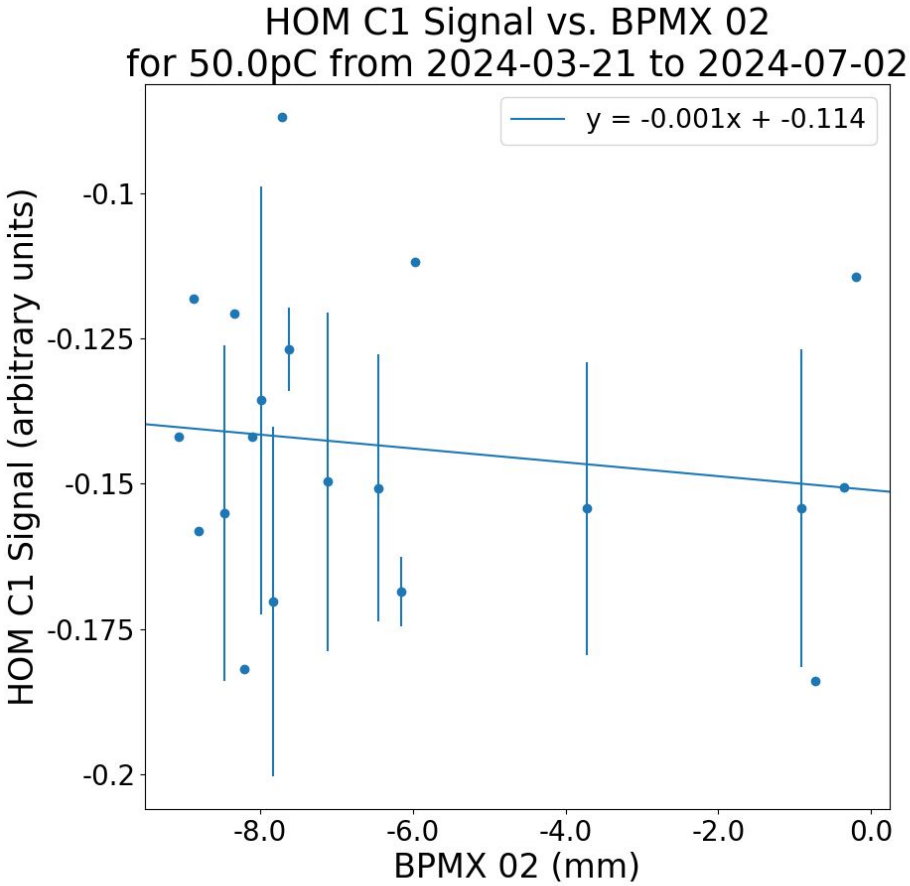



# XCOR and BPMX Phase Scans

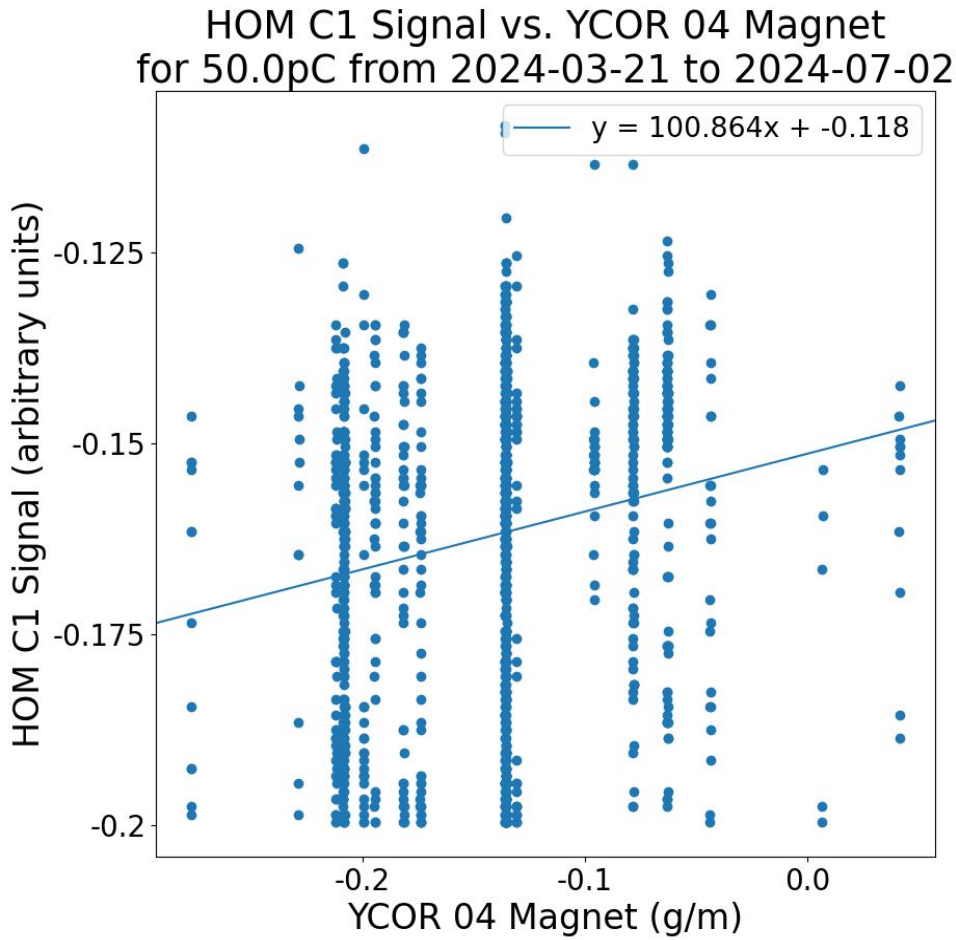

HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-03-21 to 2024-07-02
y = -13.602x + -0.124
HOM C1 Signal (arbitrary units)
-0.1
-0.125
-0.15
-0.175
-0.2
-0.4
-0.2
0.0
0.2
XCOR 04 Magnet (g/m)

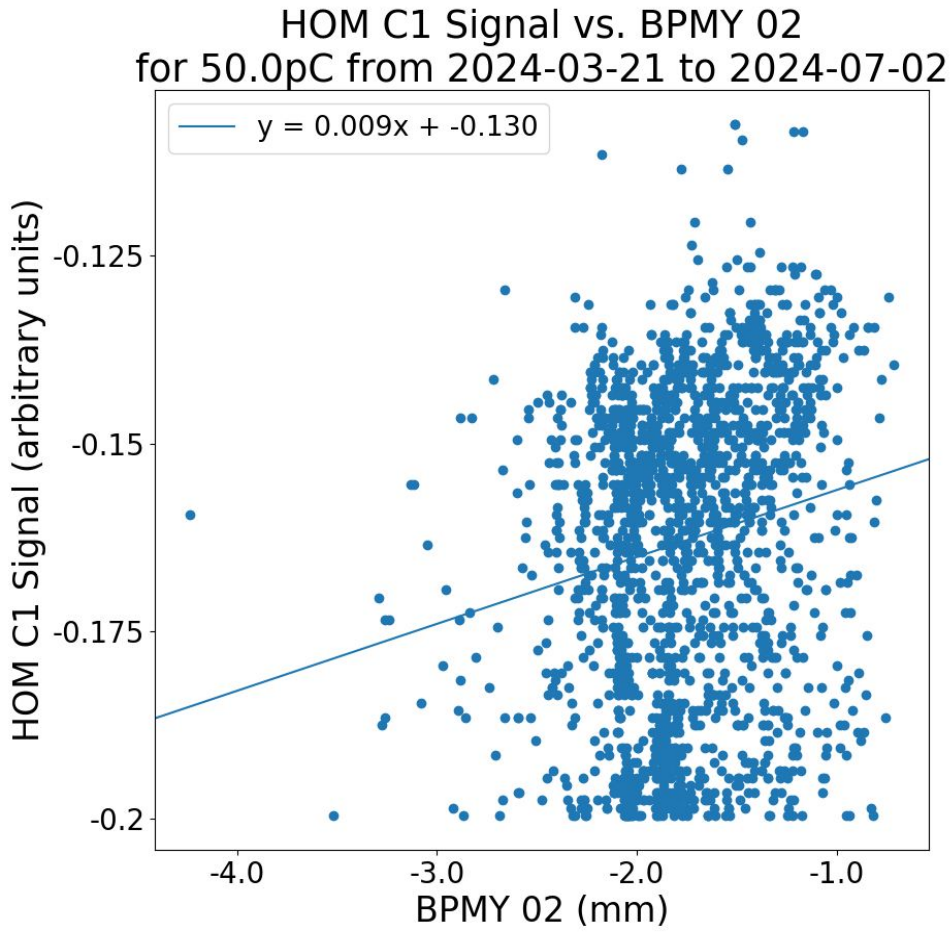

HOM C1 Signal vs. BPMX 02
for 50.0pC from 2024-03-21 to 2024-07-02
y = -0.000x + -0.126
HOM C1 Signal (arbitrary units)
-0.125
-0.15
-0.175
-0.2
-8.0
-6.0
-4.0
-2.0
0.0
BPMX 02 (mm)

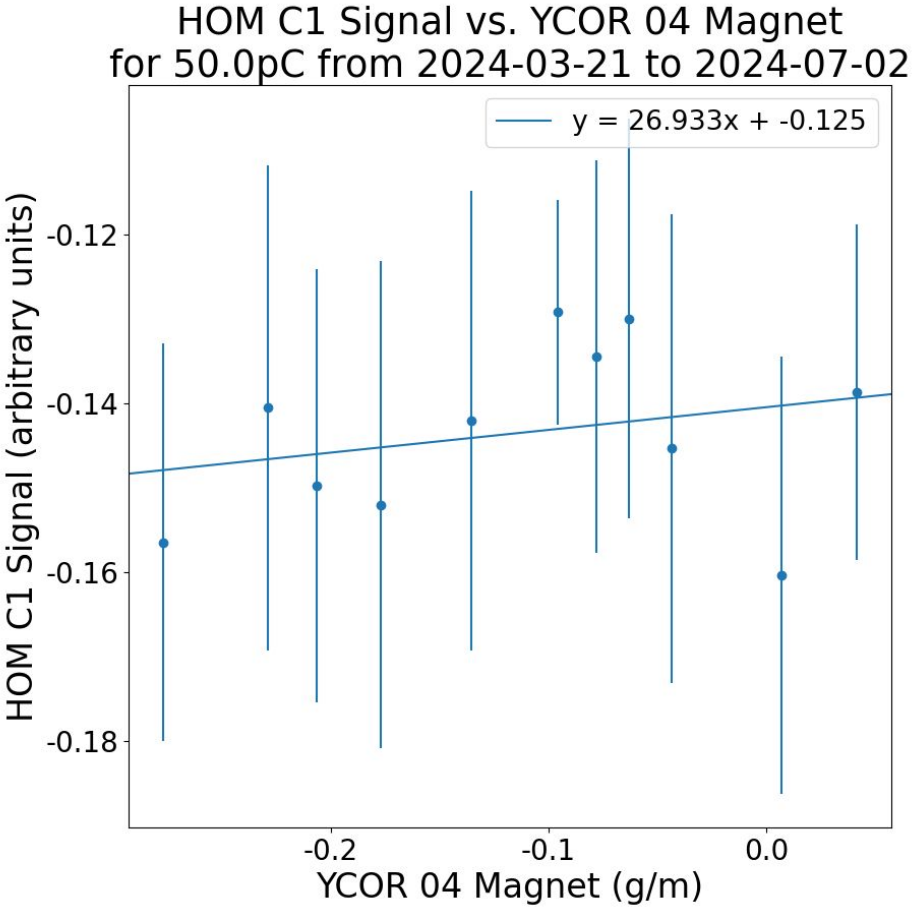

HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-03-21 to 2024-07-02
y = -3.930x + -0.137
HOM C1 Signal (arbitrary units)
-0.14
-0.16
-0.18
-0.2
-0.4
-0.2
0.0
0.2
XCOR 04 Magnet (g/m)

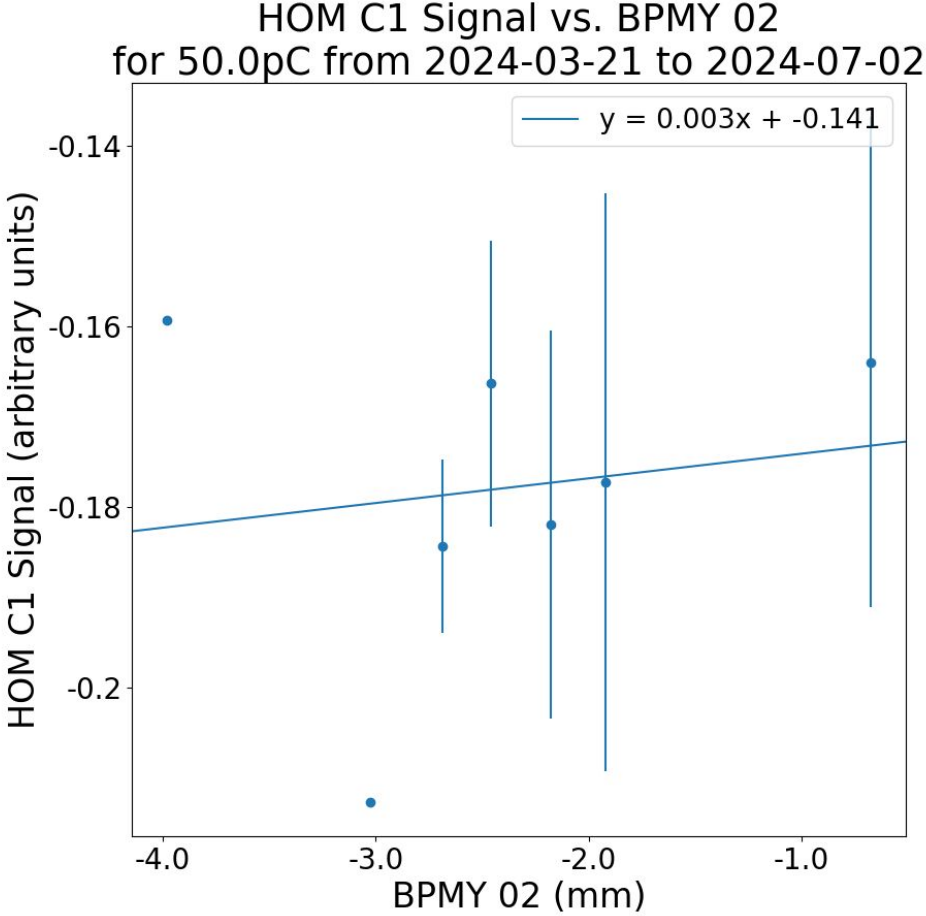

HOM C1 Signal vs. BPMX 02
for 50.0pC from 2024-03-21 to 2024-07-02
y = -0.001x + -0.114
HOM C1 Signal (arbitrary units)
-0.1
-0.125
-0.15
-0.175
-0.2
-8.0
-6.0
-4.0
-2.0
0.0
BPMX 02 (mm)

# YCOR and BPMY Phase Scans

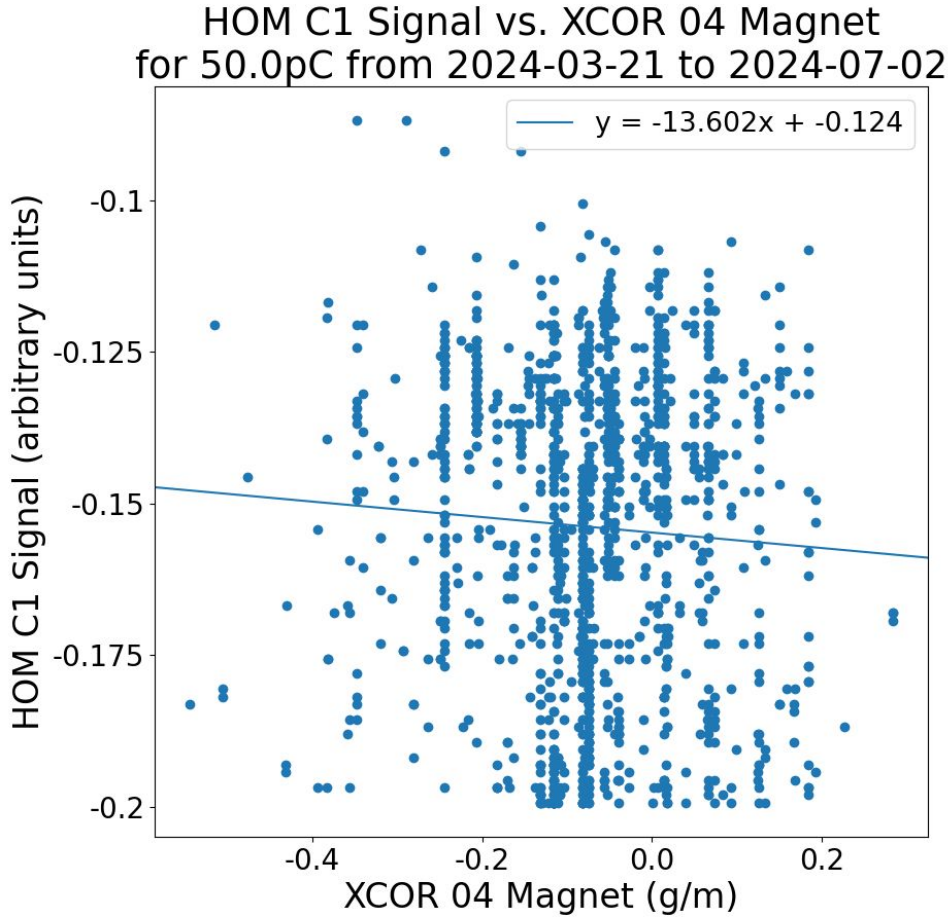

HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-03-21 to 2024-07-02
y = 100.864x + -0.118
HOM C1 Signal (arbitrary units)
-0.125
-0.15
-0.175
-0.2
-0.2
-0.1
0.0
YCOR 04 Magnet (g/m)

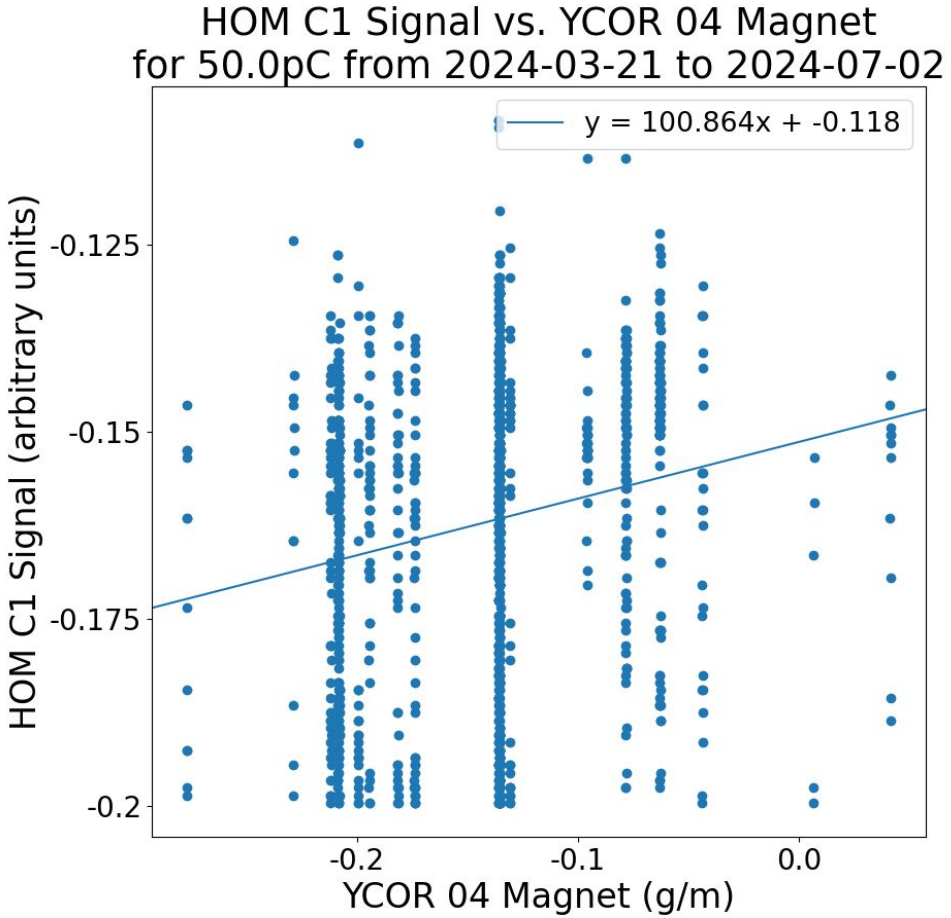

HOM C1 Signal vs. BPMY 02
for 50.0pC from 2024-03-21 to 2024-07-02
y = 0.009x + -0.130
HOM C1 Signal (arbitrary units)
-0.125
-0.15
-0.175
-0.2
-4.0
-3.0
-2.0
-1.0
BPMY 02 (mm)

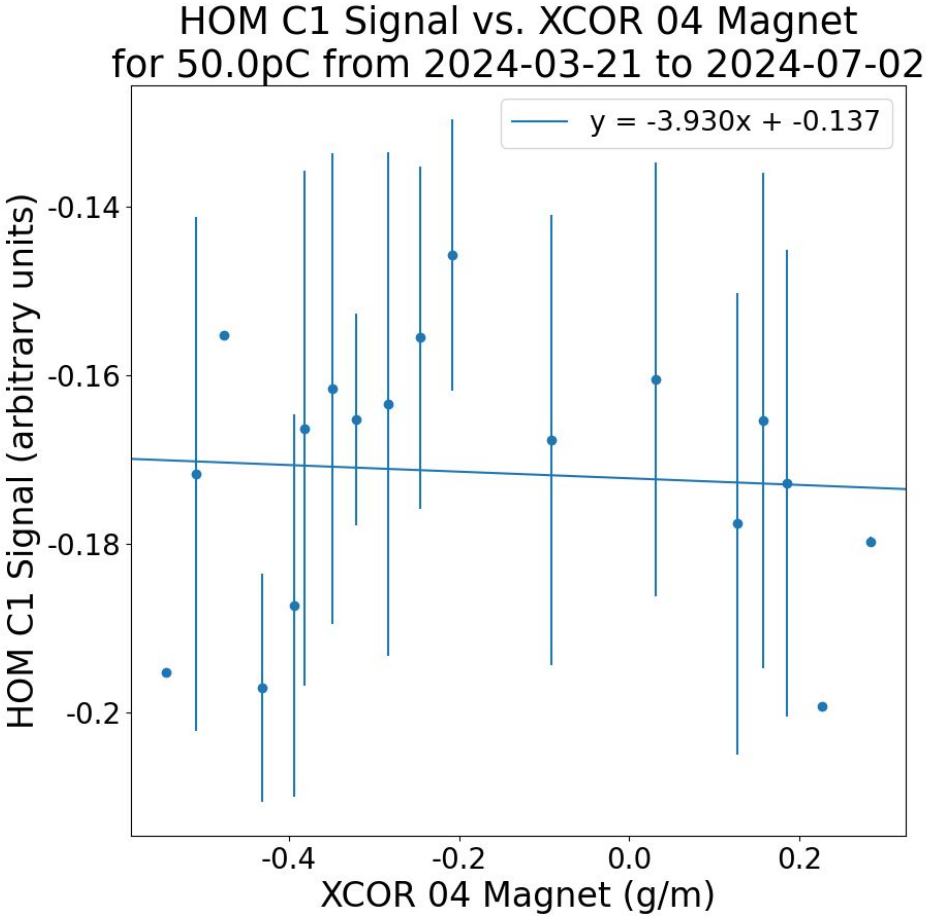

HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-03-21 to 2024-07-02
y = 26.933x + -0.125
HOM C1 Signal (arbitrary units)
-0.12
-0.14
-0.16
-0.18
-0.2
-0.1
0.0
YCOR 04 Magnet (g/m)

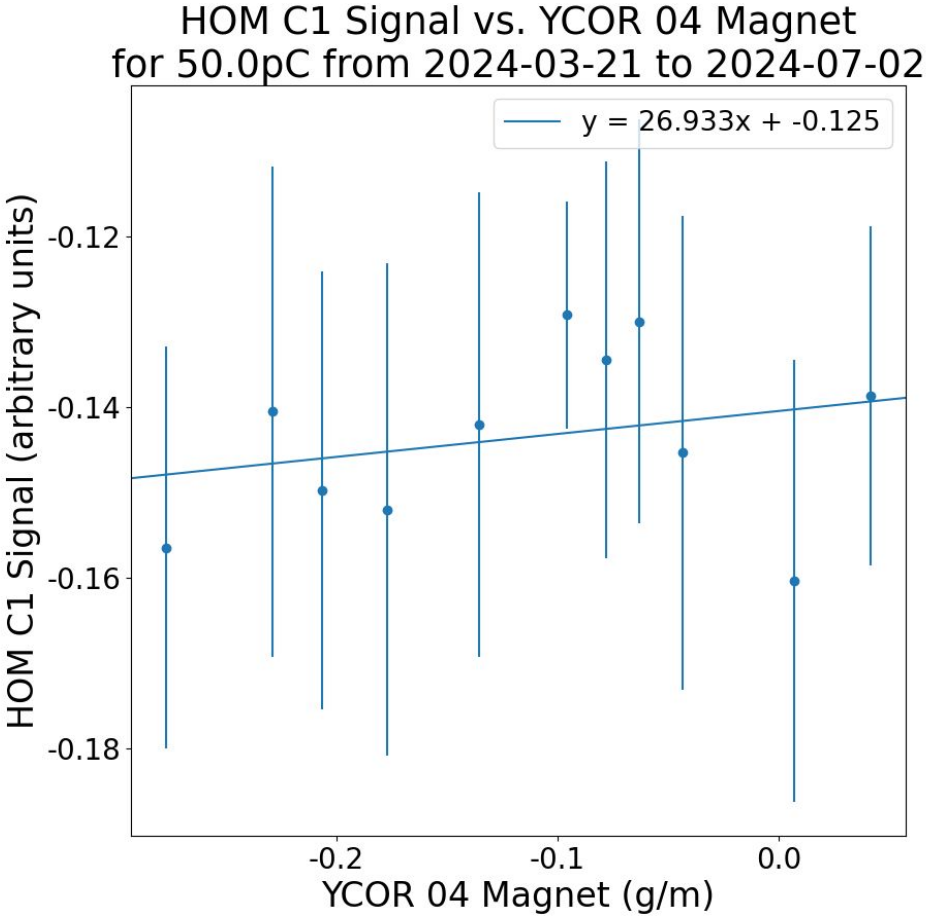

HOM C1 Signal vs. BPMY 02
for 50.0pC from 2024-03-21 to 2024-07-02
y = 0.003x + -0.141
HOM C1 Signal (arbitrary units)
-0.14
-0.16
-0.18
-0.2
-4.0
-3.0
-2.0
-1.0
BPMY 02 (mm)

# XCOR and YCOR Phase Scans


HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-03-21 to 2024-07-02
y = -13.602x + -0.124
HOM C1 Signal (arbitrary units)
-0.1
-0.125
-0.15
-0.175
-0.2
-0.4
-0.2
0.0
0.2
XCOR 04 Magnet (g/m)


HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-03-21 to 2024-07-02
y = 100.864x + -0.118
HOM C1 Signal (arbitrary units)
-0.125
-0.15
-0.175
-0.2
-0.2
-0.1
0.0
YCOR 04 Magnet (g/m)


HOM C1 Signal vs. XCOR 04 Magnet
for 50.0pC from 2024-03-21 to 2024-07-02
y = -3.930x + -0.137
HOM C1 Signal (arbitrary units)
-0.14
-0.16
-0.18
-0.2
-0.4
-0.2
0.0
0.2
XCOR 04 Magnet (g/m)


HOM C1 Signal vs. YCOR 04 Magnet
for 50.0pC from 2024-03-21 to 2024-07-02
y = 26.933x + -0.125
HOM C1 Signal (arbitrary units)
-0.12
-0.14
-0.16
-0.18
-0.2
-0.1
0.0
YCOR 04 Magnet (g/m)