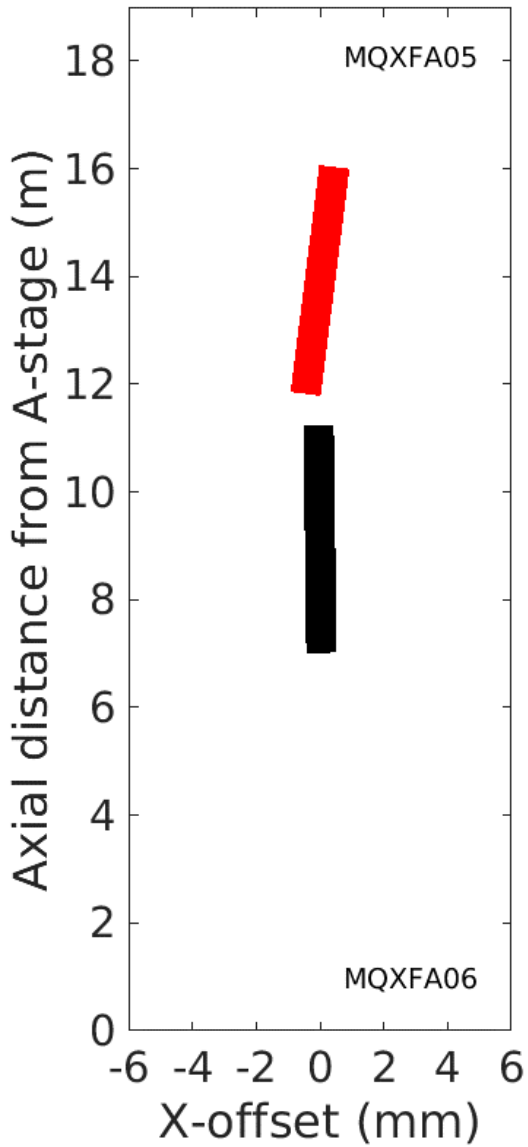
LQXFA02 preliminary magnetic measurements results
01Nov2024
J. DiMarco, M.Baldini

Alignment

Alignment Relative to MQXFA06/MQXFA05 Average Center Line
04Oct2014 - cold TC2, 4.5K

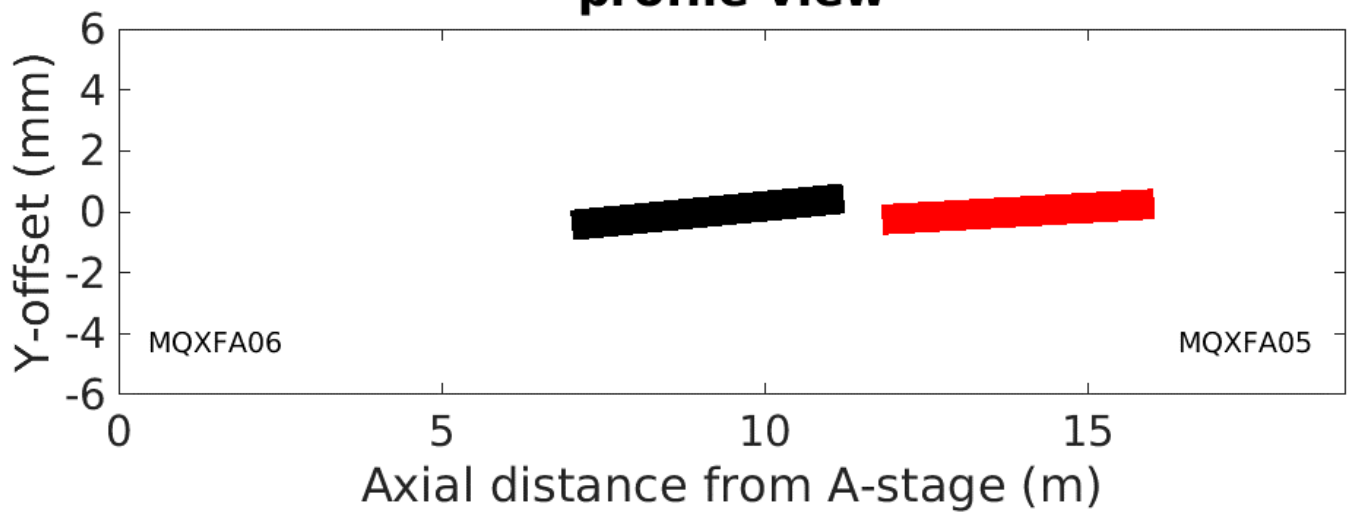
Horizontal Offsets
plan view



MQXFA06 Lead End: X= 0.046, Y= -0.440 mm
MQXFA06 Interface End: X= -0.046, Y= 0.440 mm
MQXFA05 Interface End: X= -0.453, Y= -0.257 mm
MQXFA05 Lead End: X= 0.453, Y= 0.257 mm

A06 roll angle = 0.82 mrad
A05 roll angle = -2.34 mrad
Delta angle = -3.11 mrad
Ave angle = -0.73 mrad

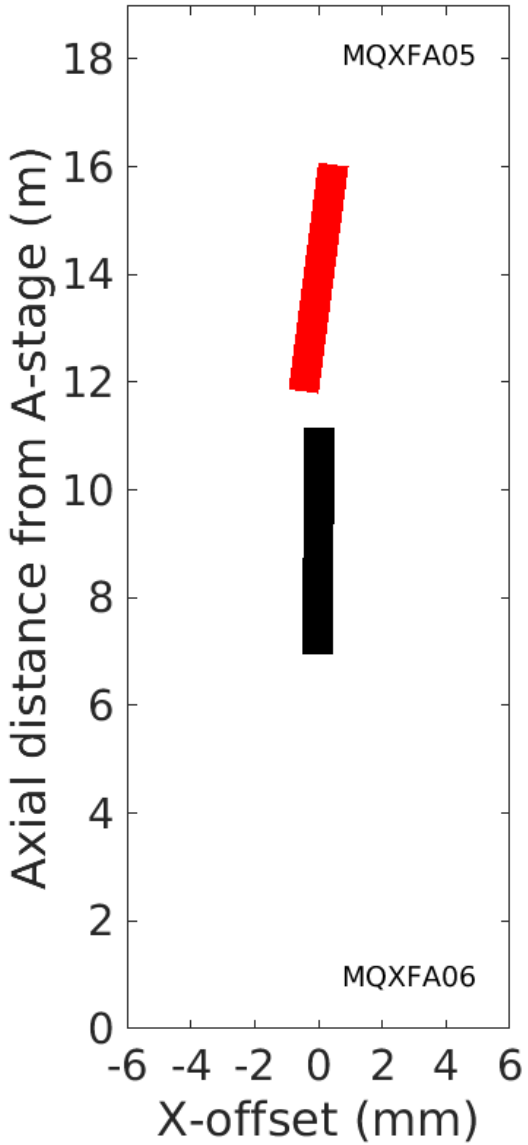
Vertical Offsets
profile view



SSW_R_20241004_161005_AC_PitchYaw, SSW_R_20241004_154612_AC_PitchYaw

Alignment Relative to MQXFA06/MQXFA05 Average Center Line
15Oct2014 - warm after TC2, 280K

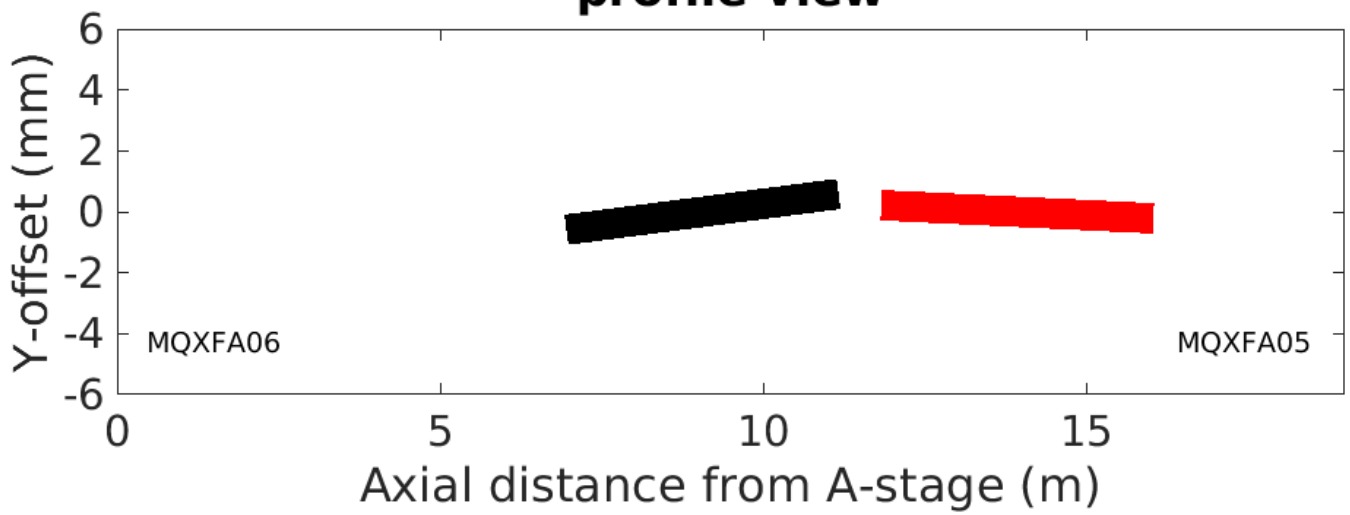
Horizontal Offsets
plan view



MQXFA06 Lead End: X= -0.026, Y= -0.589 mm
MQXFA06 Interface End: X= 0.026, Y= 0.589 mm
MQXFA05 Interface End: X= -0.467, Y= 0.216 mm
MQXFA05 Lead End: X= 0.467, Y= -0.216 mm

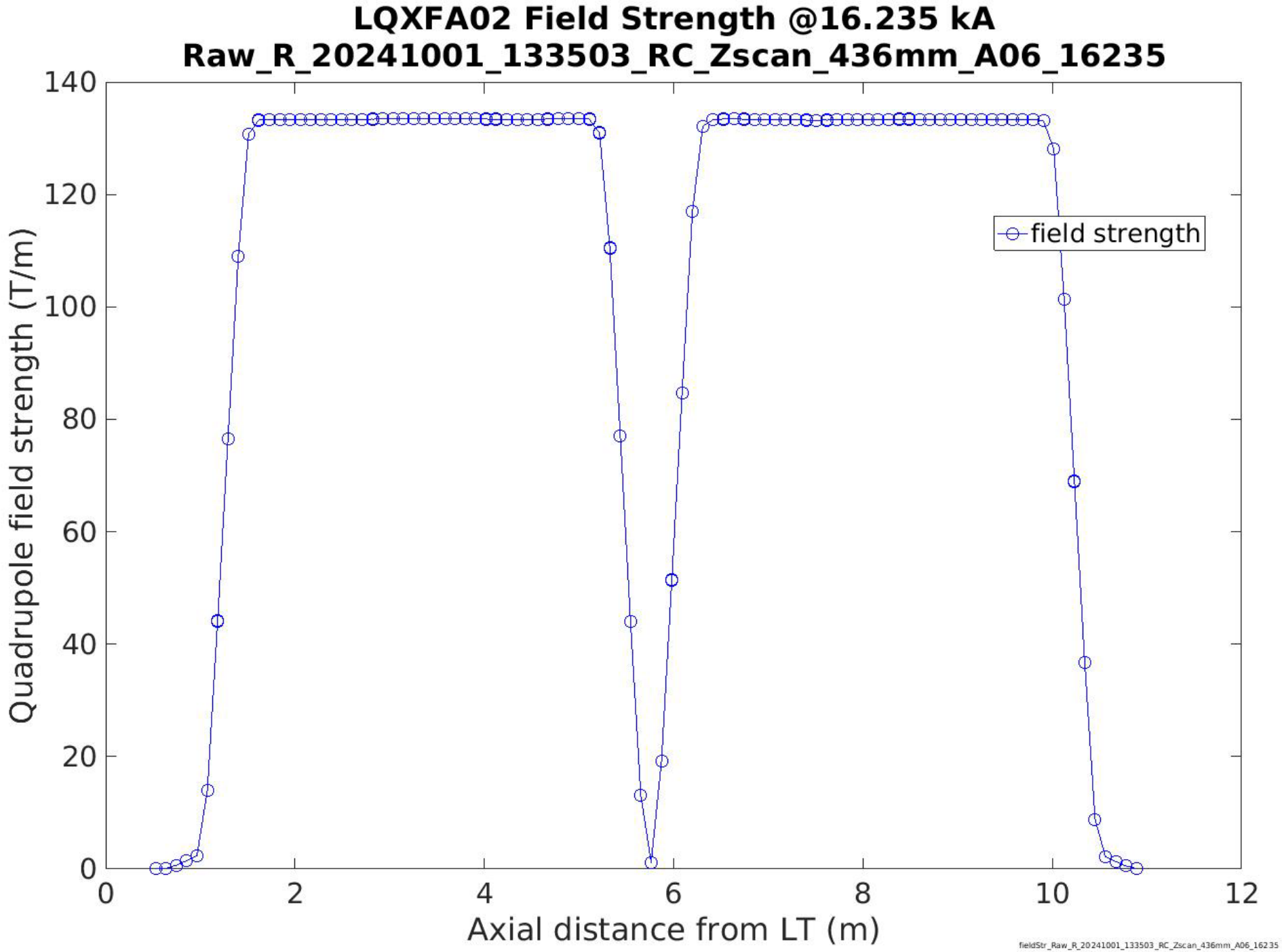
A06 roll angle = 0.54 mrad
A05 roll angle = -2.12 mrad
Delta angle = -2.66 mrad
Ave angle = -0.79 mrad

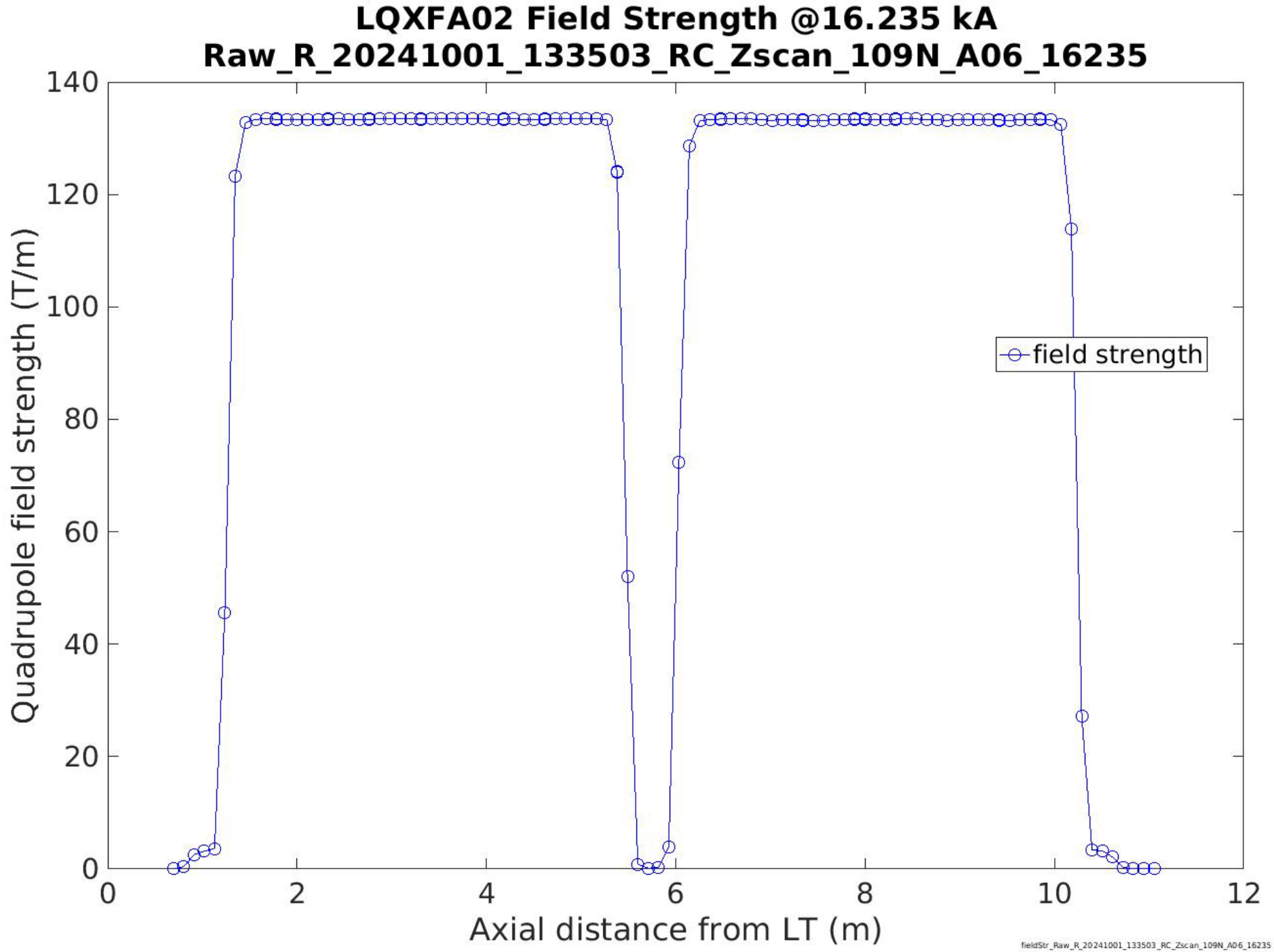
Vertical Offsets
profile view

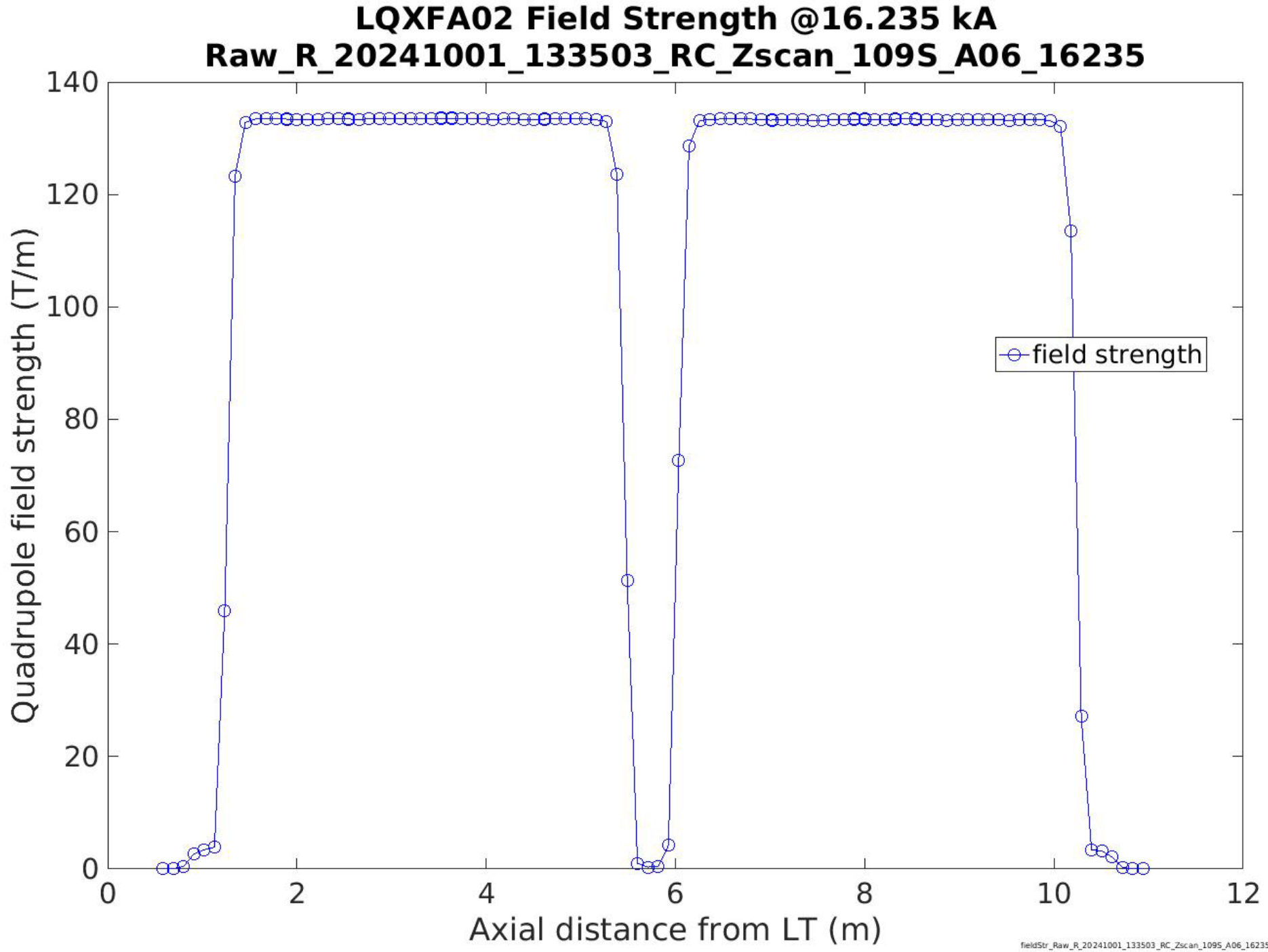


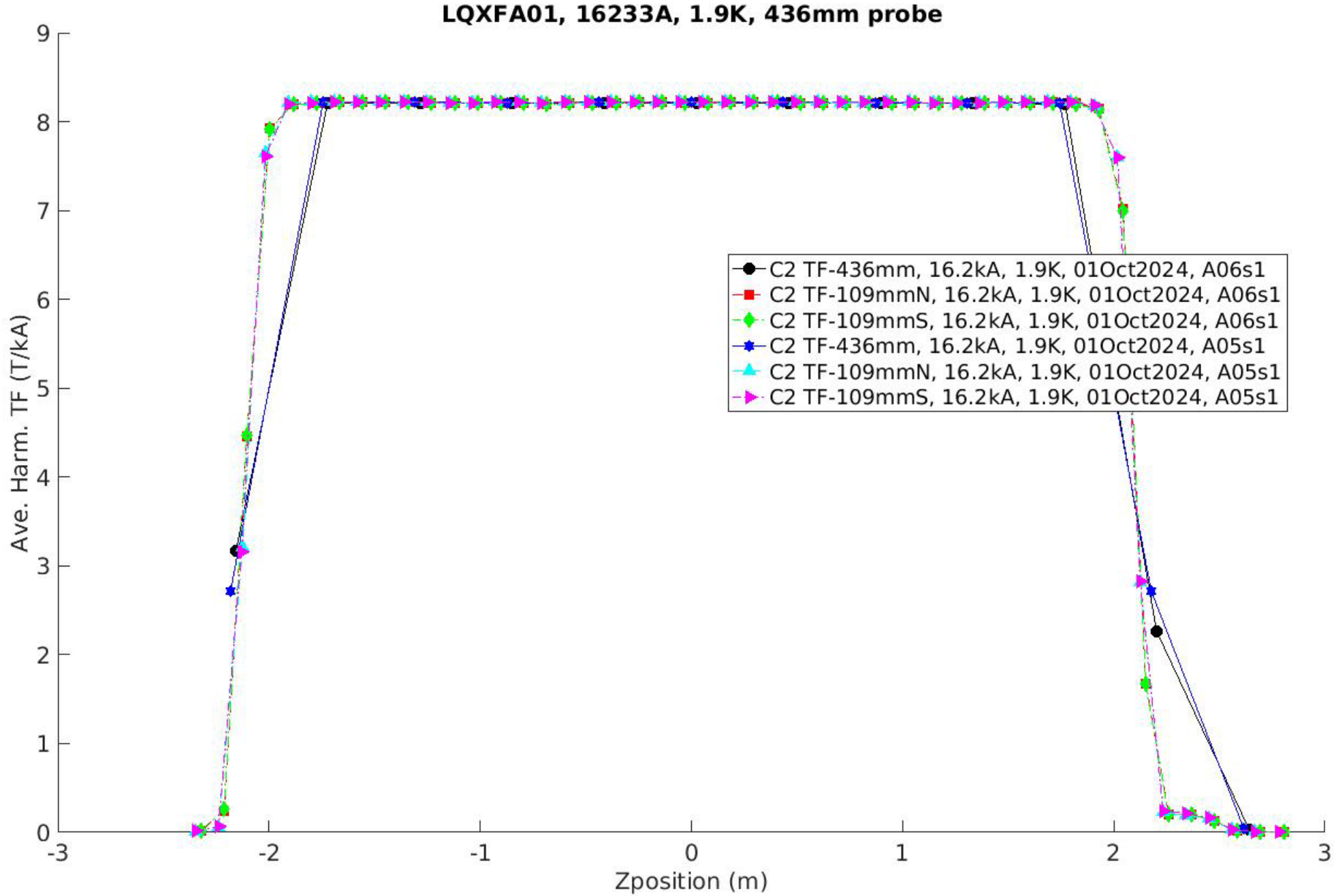
SSW_R_20241015_171714_AC_PitchYaw, SSW_R_20241015_170905_AC_PitchYaw

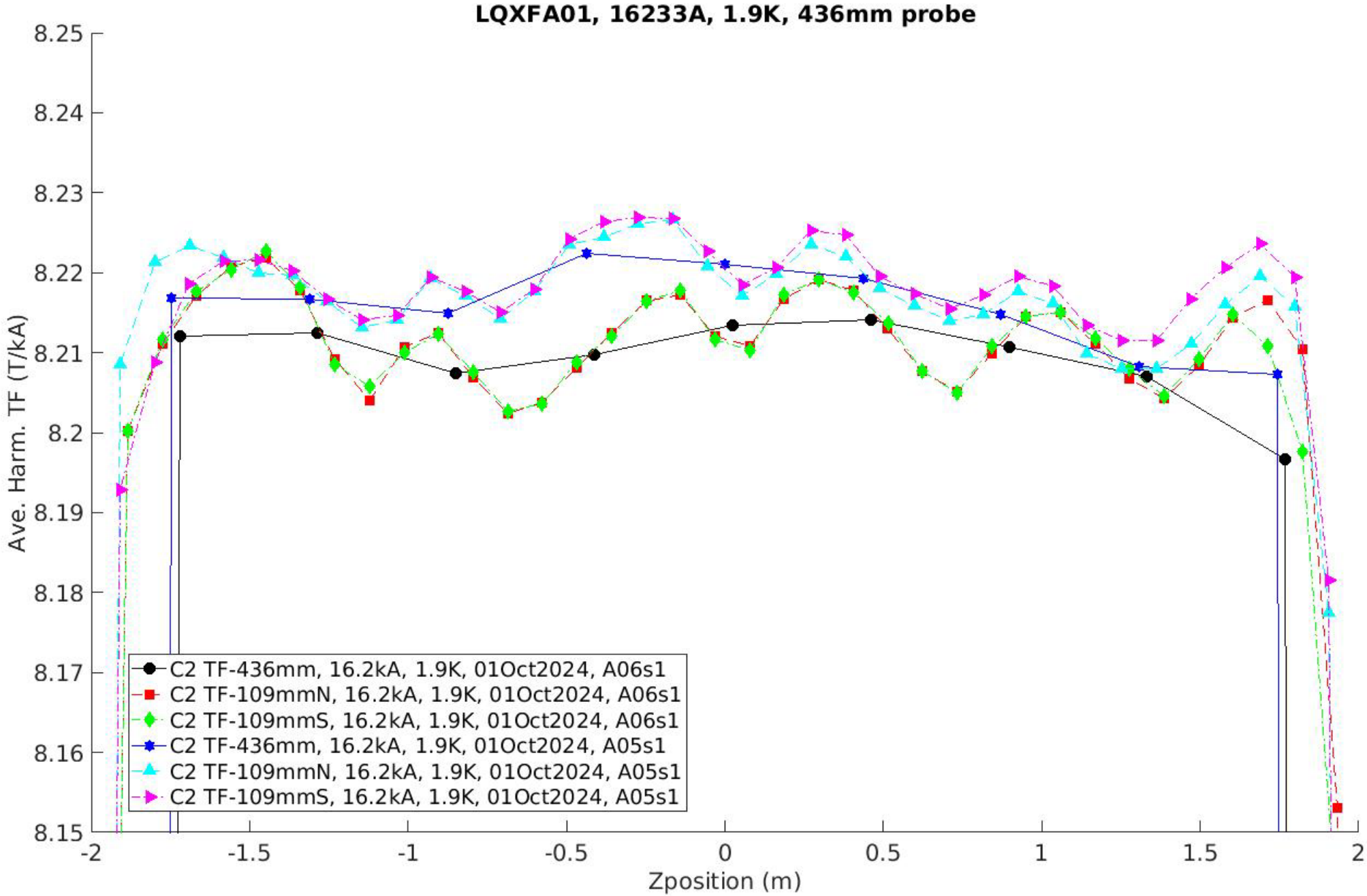
Strength measurements at 16235A and 960A


LQXFA02 Field Strength @16.235 kA
Raw_R_20241001_133503_RC_Zscan_436mm_A06_16235
Quadrupole field strength (T/m)
Axial distance from LT (m)
field strength
0
20
40
60
80
100
120
140
0
2
4
6
8
10
12
fieldStr_Raw_R_20241001_133503_RC_Zscan_436mm_A06_16235


LQXFA02 Field Strength @16.235 kA
Raw_R_20241001_133503_RC_Zscan_109N_A06_16235
Quadrupole field strength (T/m)
Axial distance from LT (m)
field strength
0
20
40
60
80
100
120
140
0
2
4
6
8
10
12
fieldStr_Raw_R_20241001_133503_RC_Zscan_109N_A06_16235


LQXFA02 Field Strength @16.235 kA
Raw_R_20241001_133503_RC_Zscan_109S_A06_16235
Quadrupole field strength (T/m)
Axial distance from LT (m)
field strength
0
20
40
60
80
100
120
140
0
2
4
6
8
10
12
fieldStr_Raw_R_20241001_133503_RC_Zscan_109S_A06_16235


LQXFA01, 16233A, 1.9K, 436mm probe
Ave. Harm. TF (T/kA)
Zposition (m)
C2 TF-436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
C2 TF-109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
C2 TF-109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
C2 TF-436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
C2 TF-109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
C2 TF-109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1


LQXFA01, 16233A, 1.9K, 436mm probe
Ave. Harm. TF (T/kA)
Zposition (m)
8.25
8.24
8.23
8.22
8.21
8.2
8.19
8.18
8.17
8.16
8.15
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
C2 TF-436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
C2 TF-109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
C2 TF-109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
C2 TF-436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
C2 TF-109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
C2 TF-109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1

Raw_R_20241001_133503_RC_Zscan_436mm_A06_16235_outHarm.dat

integralGdlMag1(MQXFA05): 562.28 T
integralGdlMag2(MQXFA06): 561.87 T
integralGdlTotal: 1124.14 T

magnetic length mag1: 4.215 m
magnetic length mag2: 4.215 m

Body field TF mag 1:, 8.217, T/m/kA,
Body field TF mag 2:, 8.211, T/m/kA,

ZcenMag1: 3.3621 m
ZcenMag2: 8.1379 m

magnet center separation: 4.7758 m

Raw_R_20241001_133503_RC_Zscan_109N_A06_16235_outHarm.dat

integralGdlMag1(MQXFA05): 562.33 T
integralGdlMag2(MQXFA06): 561.99 T
integralGdlTotal: 1124.32 T

magnetic length mag1: 4.215 m
magnetic length mag2: 4.215 m

Body field TF mag 1:, 8.218, T/m/kA,
Body field TF mag 2:, 8.212, T/m/kA,

ZcenMag1: 3.3629 m
ZcenMag2: 8.1385 m

magnet center separation: 4.7756 m

Raw_R_20241001_133503_RC_Zscan_109S_A06_16235_outHarm.dat

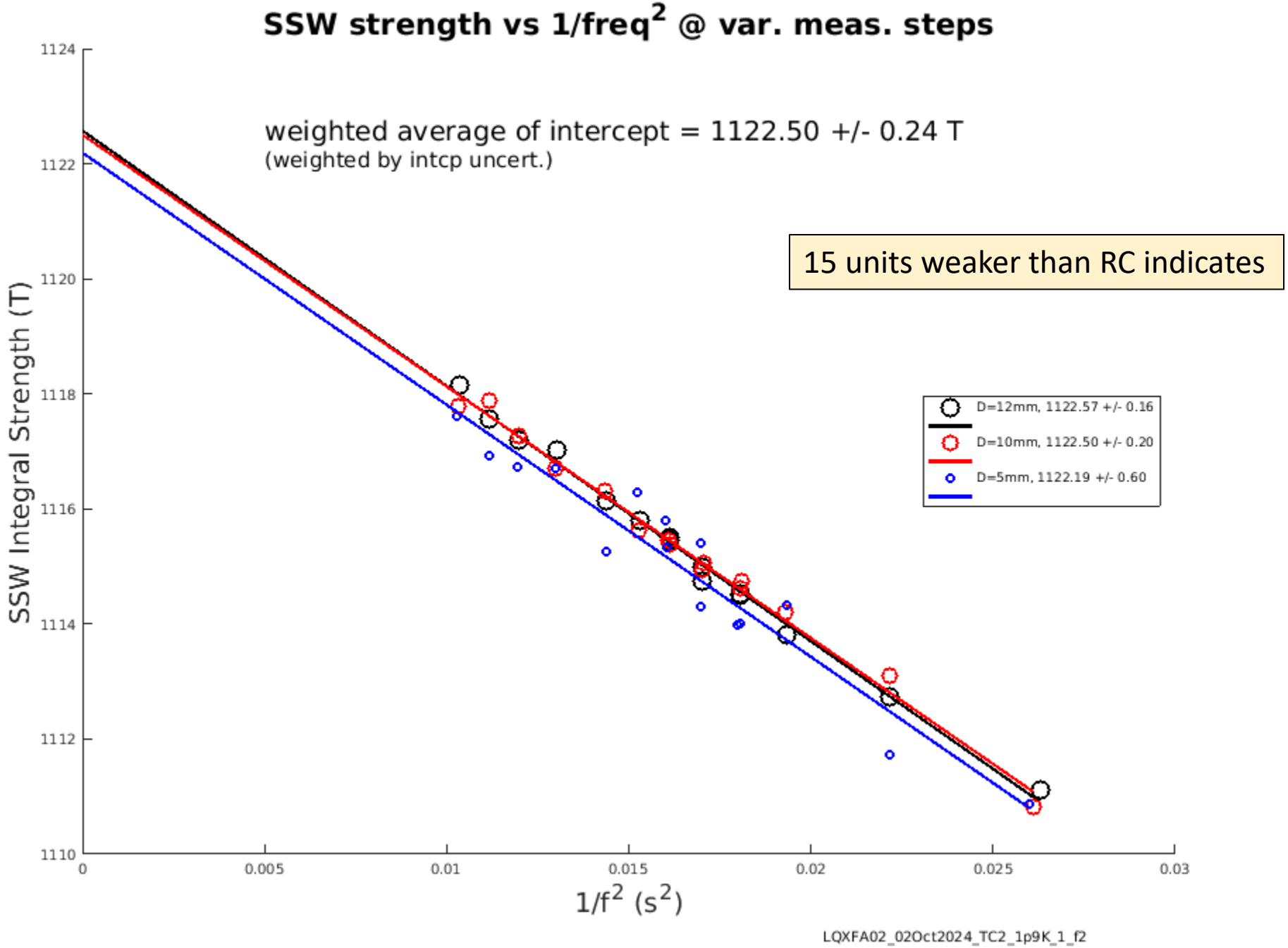
integralGdlMag1(MQXFA05): 562.40 T
integralGdlMag2(MQXFA06): 561.98 T
integralGdlTotal: 1124.38 T

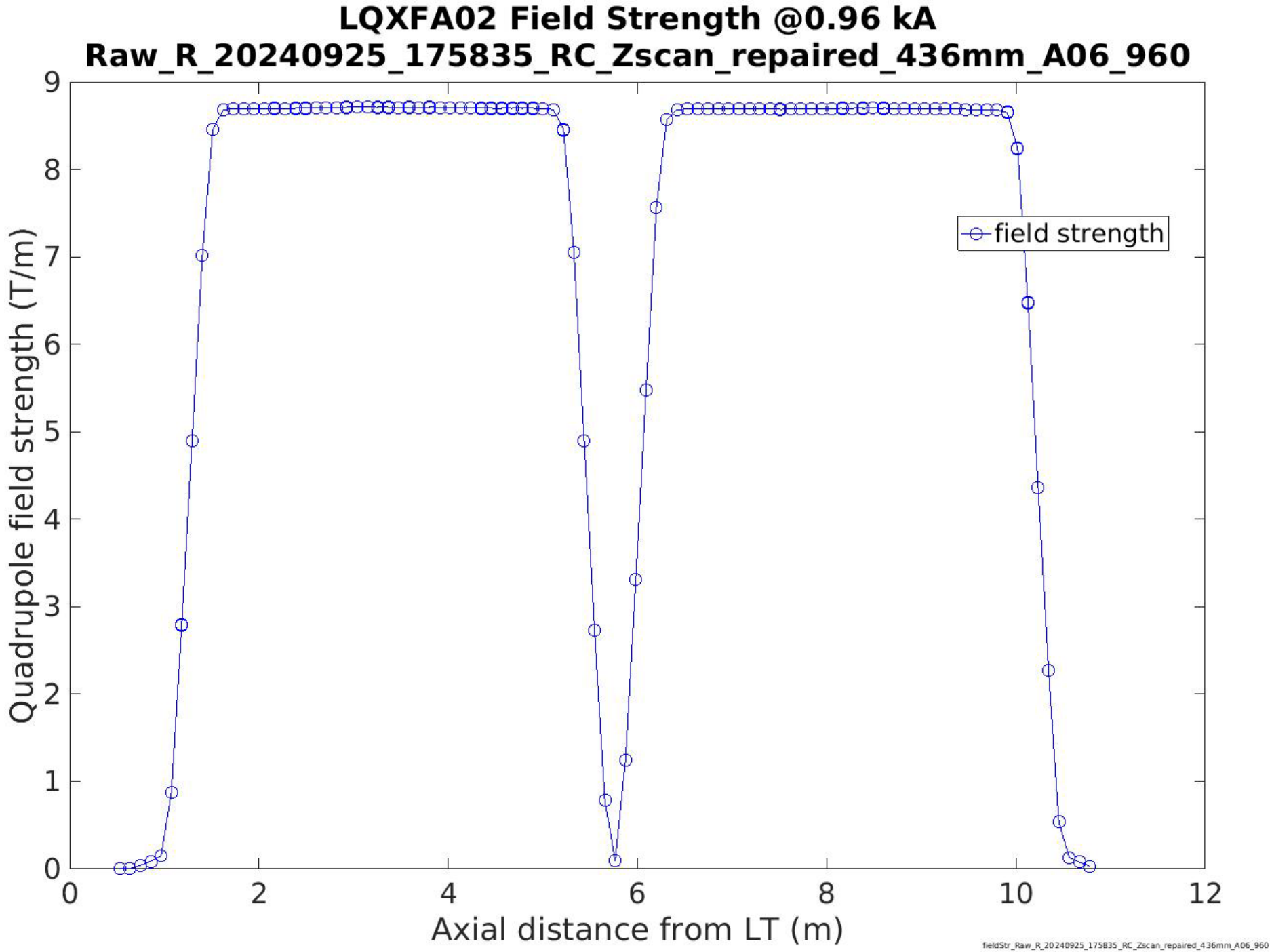
magnetic length mag1: 4.216 m
magnetic length mag2: 4.216 m

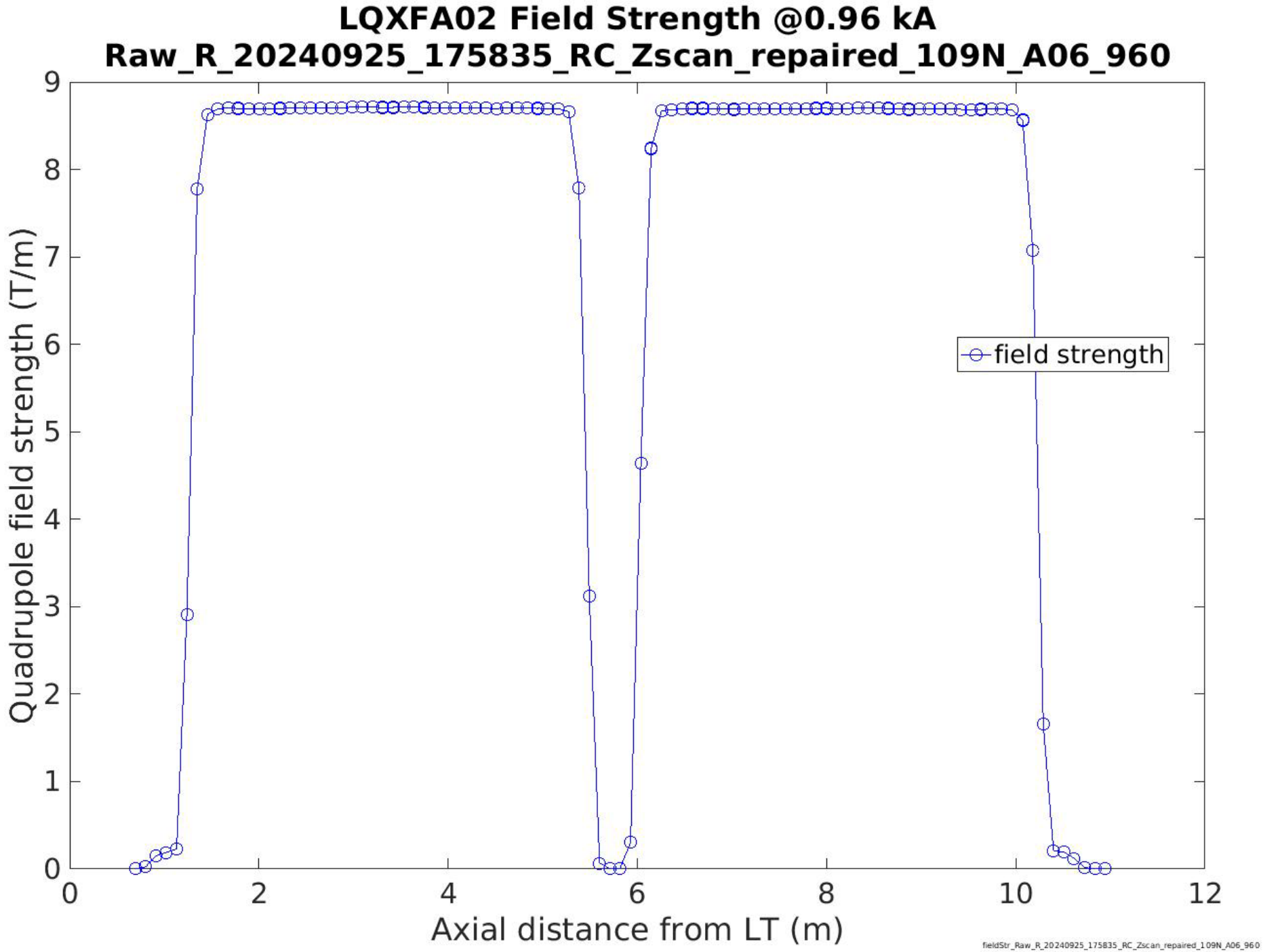
Body field TF mag 1:, 8.217, T/m/kA,
Body field TF mag 2:, 8.211, T/m/kA,

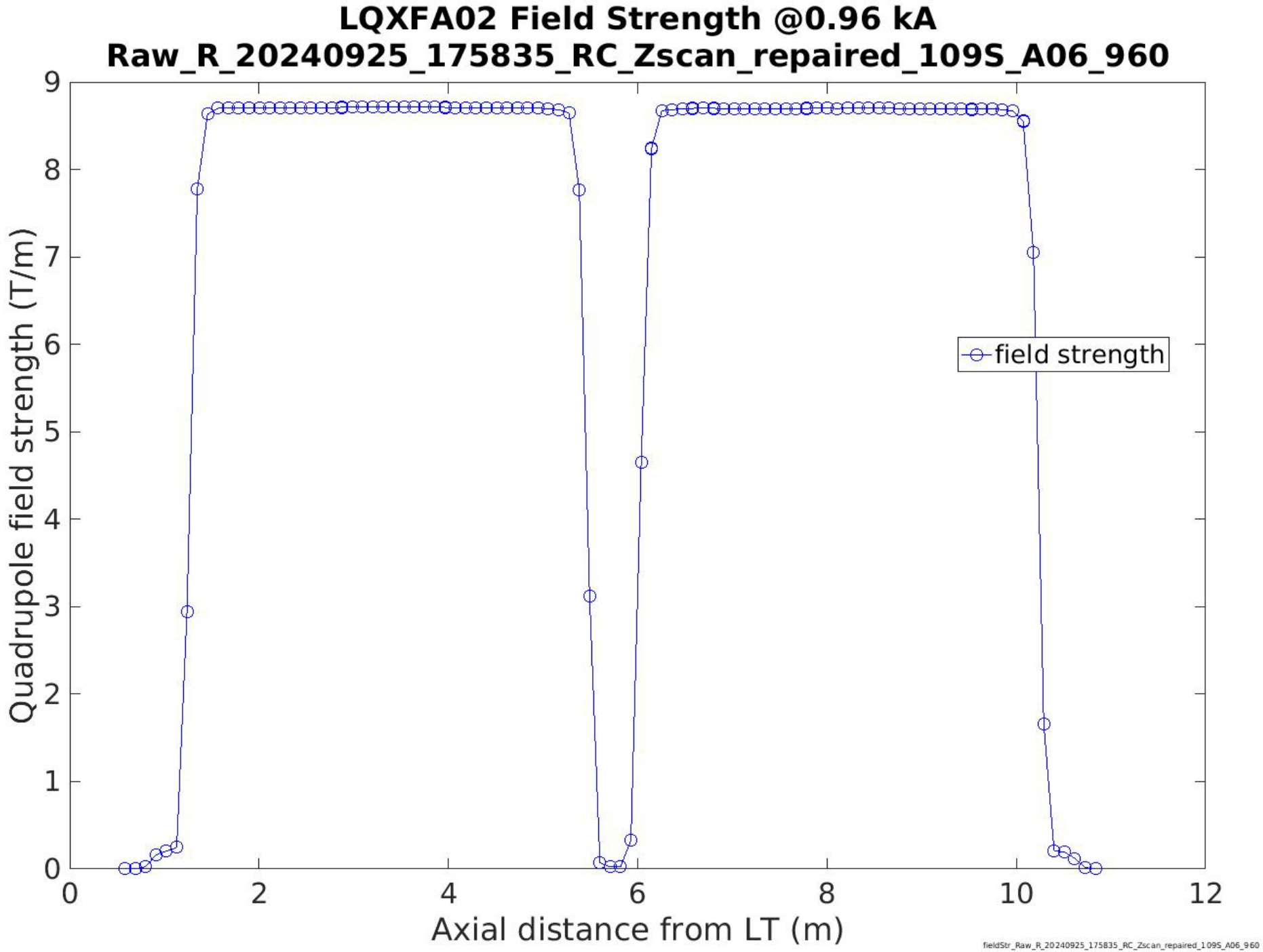
ZcenMag1: 3.3619 m
ZcenMag2: 8.1380 m

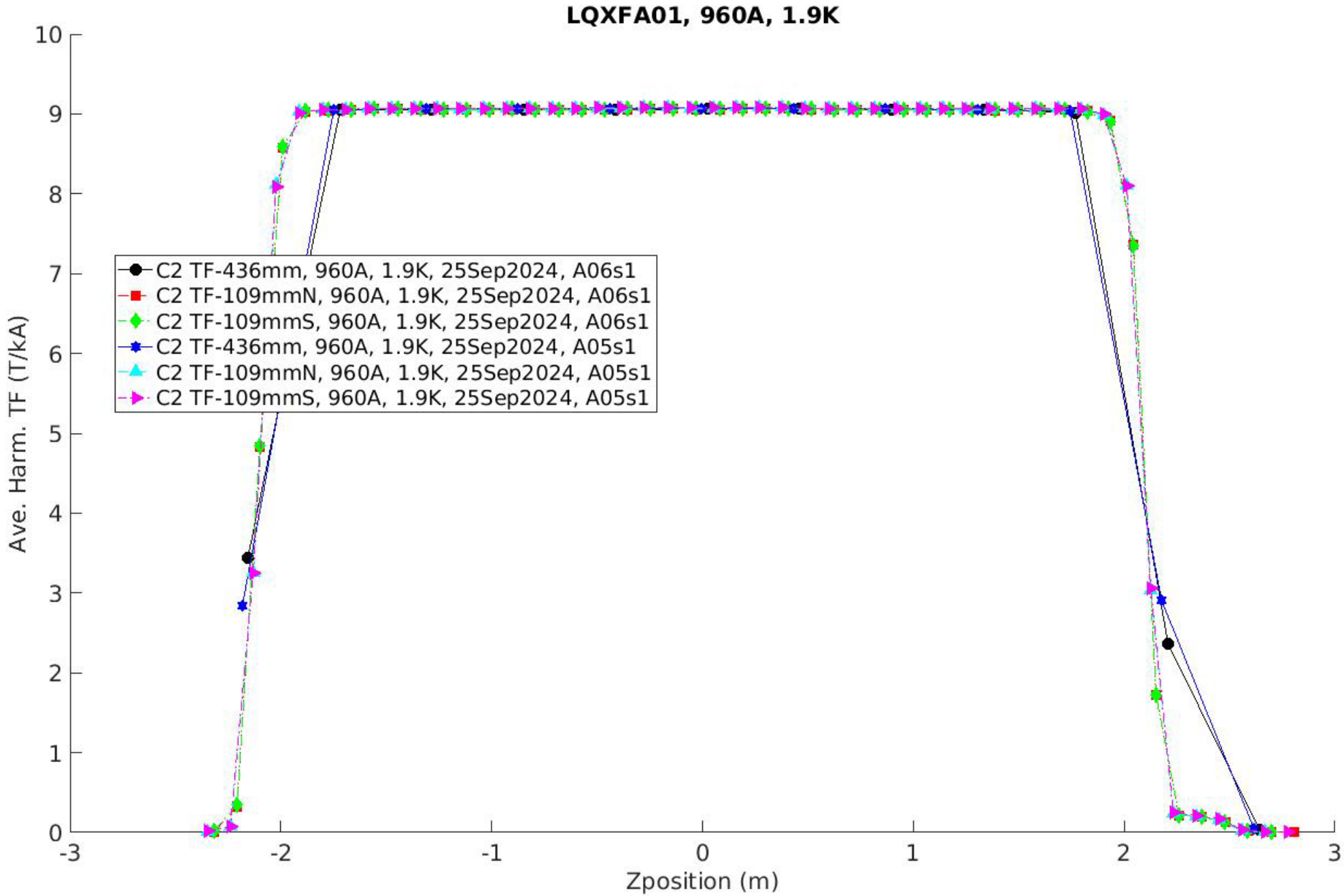
magnet center separation: 4.7761 m

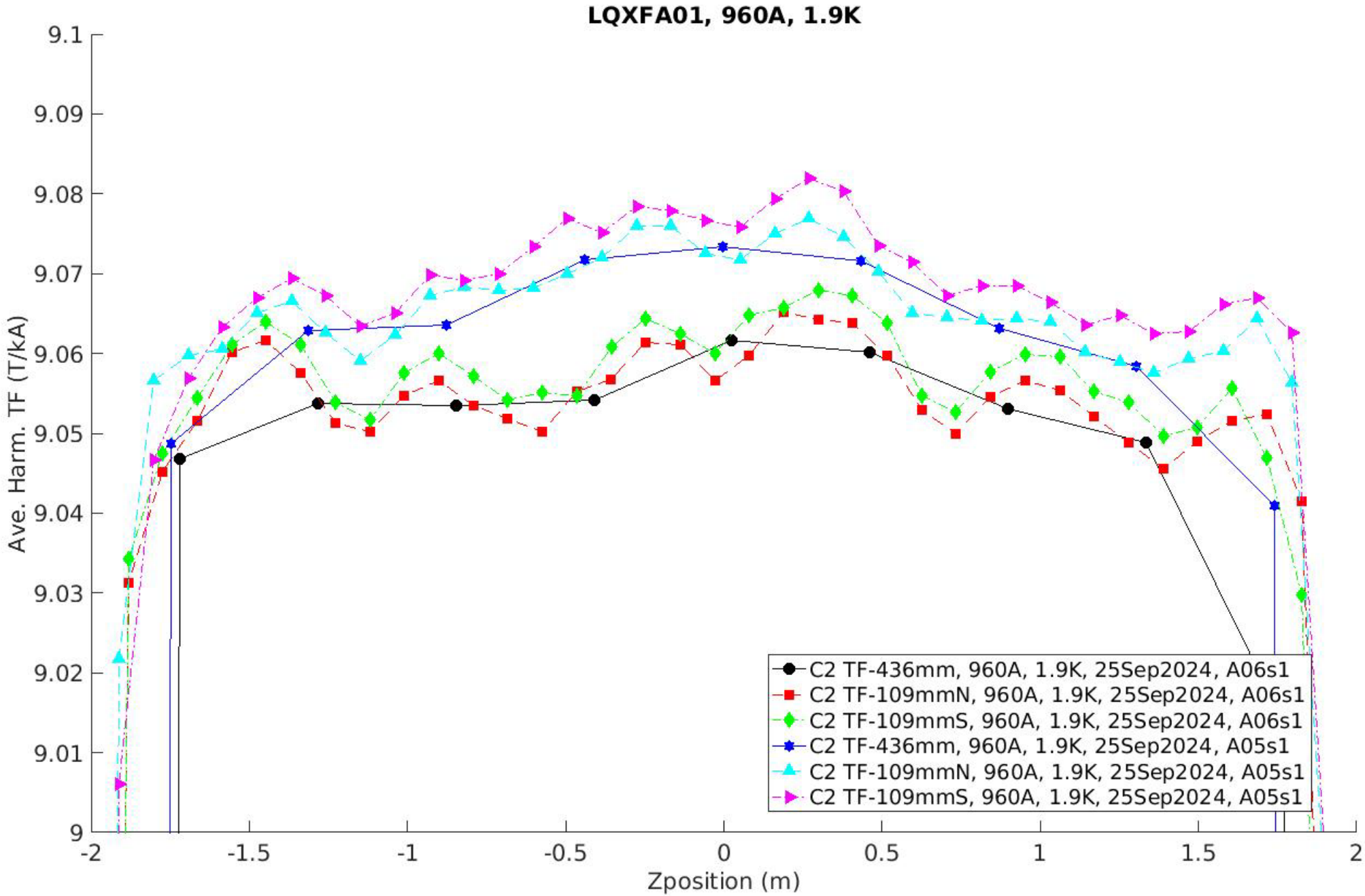

SSW strength vs 1/freq^2 @ var. meas. steps
weighted average of intercept = 1122.50 +/- 0.24 T
(weighted by intcp uncert.)
15 units weaker than RC indicates
D=12mm, 1122.57 +/- 0.16
D=10mm, 1122.50 +/- 0.20
D=5mm, 1122.19 +/- 0.60
SSW Integral Strength (T)
1/f^2 (s^2)
1124
1122
1120
1118
1116
1114
1112
1110
0
0.005
0.01
0.015
0.02
0.025
0.03
LQXFA02_02Oct2024_TC2_1p9K_1_f2


LQXFA02 Field Strength @0.96 kA
Raw_R_20240925_175835_RC_Zscan_repaired_436mm_A06_960
Quadrupole field strength (T/m)
Axial distance from LT (m)
field strength
0
1
2
3
4
5
6
7
8
9
0
2
4
6
8
10
12
fieldStr_Raw_R_20240925_175835_RC_Zscan_repaired_436mm_A06_960


LQXFA02 Field Strength @0.96 kA
Raw_R_20240925_175835_RC_Zscan_repaired_109N_A06_960
Quadrupole field strength (T/m)
Axial distance from LT (m)
field strength
0
1
2
3
4
5
6
7
8
9
0
2
4
6
8
10
12
fieldStr_Raw_R_20240925_175835_RC_Zscan_repaired_109N_A06_960


LQXFA02 Field Strength @0.96 kA
Raw_R_20240925_175835_RC_Zscan_repaired_109S_A06_960
Quadrupole field strength (T/m)
Axial distance from LT (m)
field strength
0
1
2
3
4
5
6
7
8
9
0
2
4
6
8
10
12
fieldStr_Raw_R_20240925_175835_RC_Zscan_repaired_109S_A06_960


LQXFA01, 960A, 1.9K
C2 TF-436mm, 960A, 1.9K, 25Sep2024, A06s1
C2 TF-109mmN, 960A, 1.9K, 25Sep2024, A06s1
C2 TF-109mmS, 960A, 1.9K, 25Sep2024, A06s1
C2 TF-436mm, 960A, 1.9K, 25Sep2024, A05s1
C2 TF-109mmN, 960A, 1.9K, 25Sep2024, A05s1
C2 TF-109mmS, 960A, 1.9K, 25Sep2024, A05s1
Ave. Harm. TF (T/kA)
Zposition (m)
10
9
8
7
6
5
4
3
2
1
0
-3
-2
-1
0
1
2
3


LQXFA01, 960A, 1.9K
Ave. Harm. TF (T/kA)
Zposition (m)
9.1
9.09
9.08
9.07
9.06
9.05
9.04
9.03
9.02
9.01
9
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
C2 TF-436mm, 960A, 1.9K, 25Sep2024, A06s1
C2 TF-109mmN, 960A, 1.9K, 25Sep2024, A06s1
C2 TF-109mmS, 960A, 1.9K, 25Sep2024, A06s1
C2 TF-436mm, 960A, 1.9K, 25Sep2024, A05s1
C2 TF-109mmN, 960A, 1.9K, 25Sep2024, A05s1
C2 TF-109mmS, 960A, 1.9K, 25Sep2024, A05s1

Raw_R_20240925_175835_RC_Zscan_repaired_436mm_A06_960_outHarm.dat

integralGdlMag1(MQXFA05): 36.59 T
integralGdlMag2(MQXFA06): 36.55 T
integralGdlTotal: 73.14 T

magnetic length mag1: 4.205 m
magnetic length mag2: 4.205 m

Body field TF mag 1:, 9.064, T/m/kA,
Body field TF mag 2:, 9.054, T/m/kA,

ZcenMag1: 3.3628 m
ZcenMag2: 8.1373 m

magnet center separation: 4.7745 m

Raw_R_20240925_175835_RC_Zscan_repaired_109N_A06_960_outHarm.dat

integralGdlMag1(MQXFA05): 36.58 T
integralGdlMag2(MQXFA06): 36.55 T
integralGdlTotal: 73.13 T

magnetic length mag1: 4.204 m
magnetic length mag2: 4.206 m

Body field TF mag 1:, 9.065, T/m/kA,
Body field TF mag 2:, 9.054, T/m/kA,

ZcenMag1: 3.3639 m
ZcenMag2: 8.1380 m

magnet center separation: 4.7741 m

Raw_R_20240925_175835_RC_Zscan_repaired_109S_A06_960_outHarm.dat

integralGdlMag1(MQXFA05): 36.60 T
integralGdlMag2(MQXFA06): 36.57 T
integralGdlTotal: 73.17 T

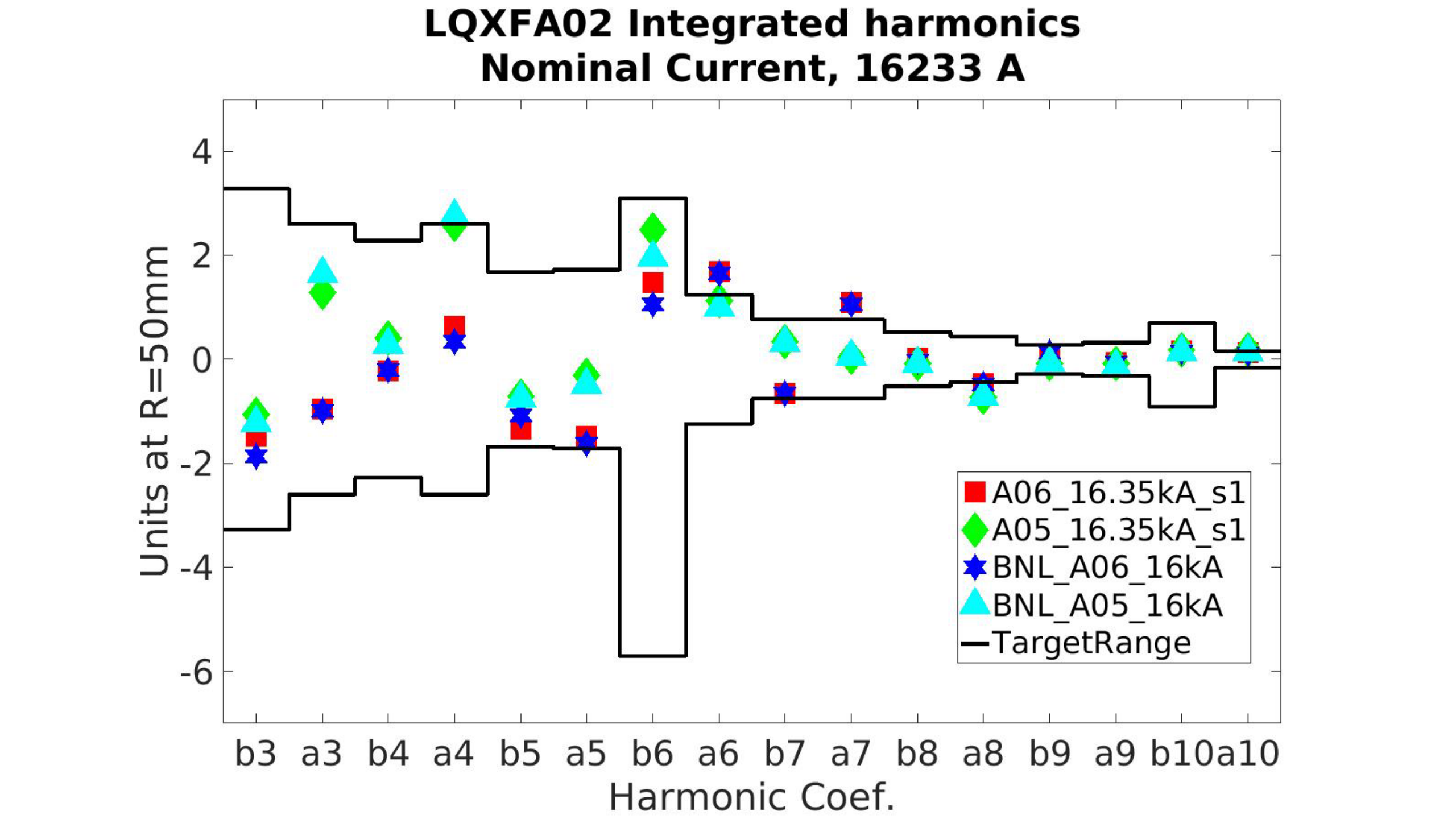
magnetic length mag1: 4.205 m
magnetic length mag2: 4.206 m

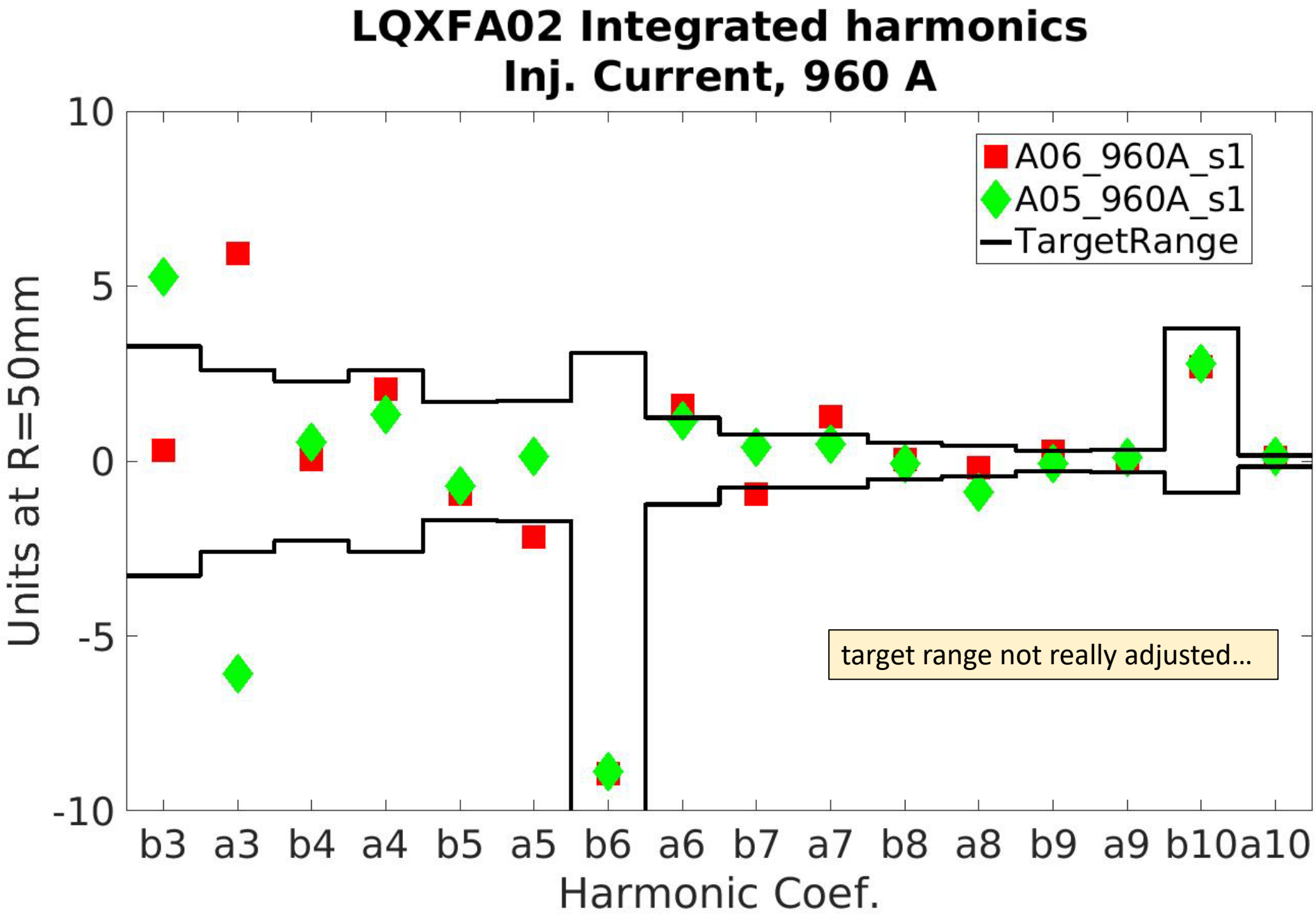
Body field TF mag 1:, 9.065, T/m/kA,
Body field TF mag 2:, 9.056, T/m/kA,

ZcenMag1: 3.3629 m
ZcenMag2: 8.1373 m

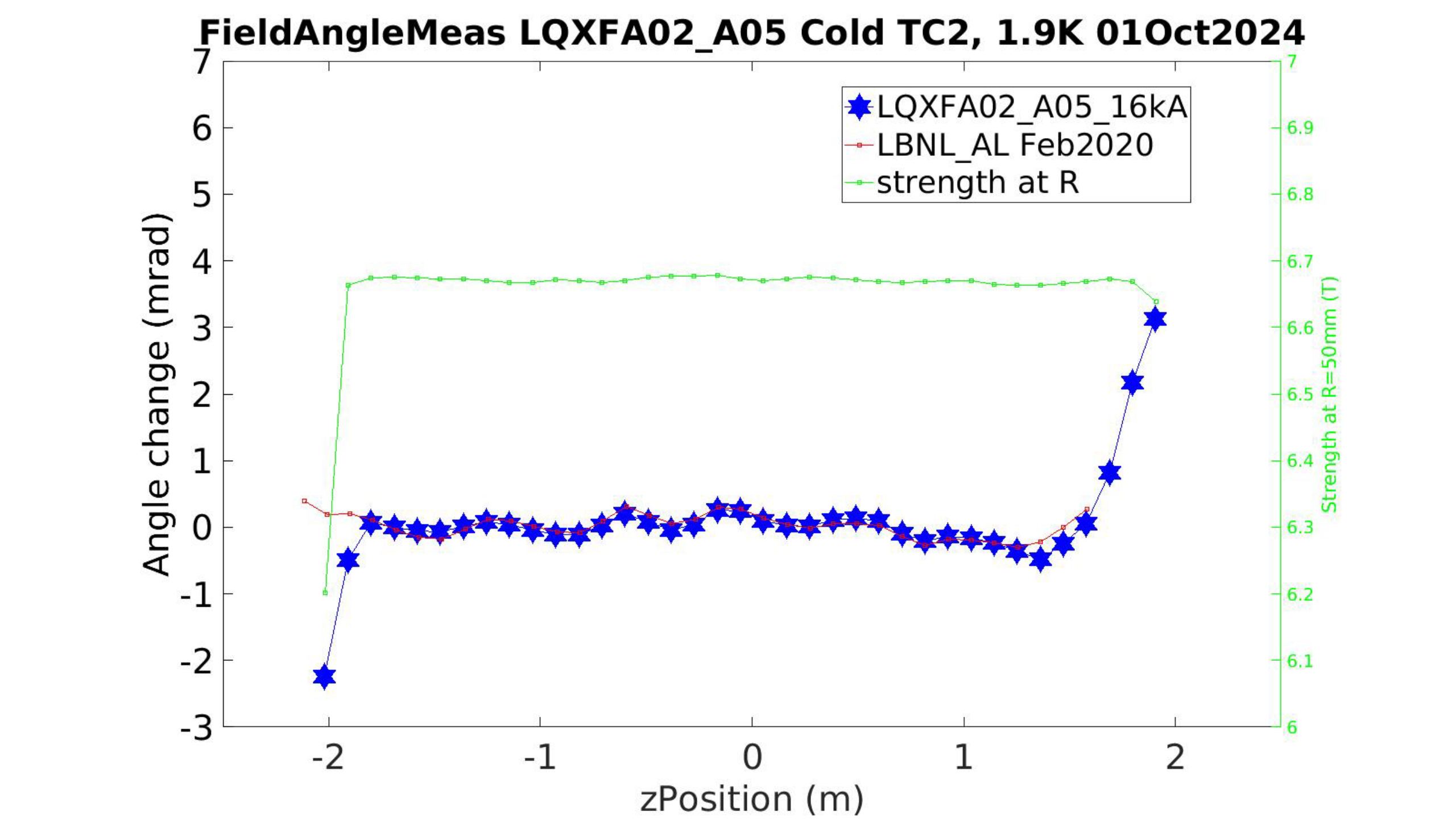
magnet center separation: 4.7744 m

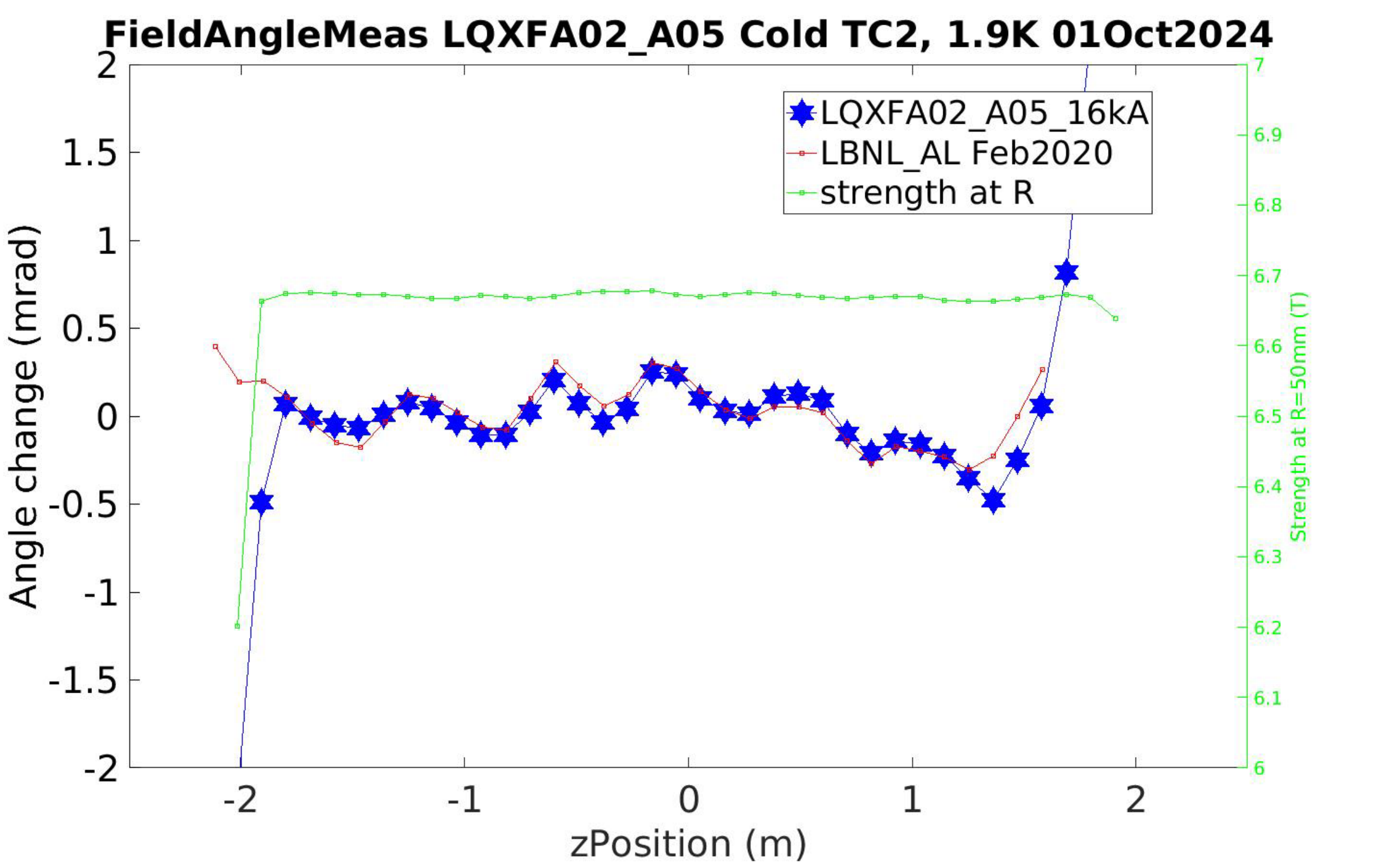
Integrated Harmonics

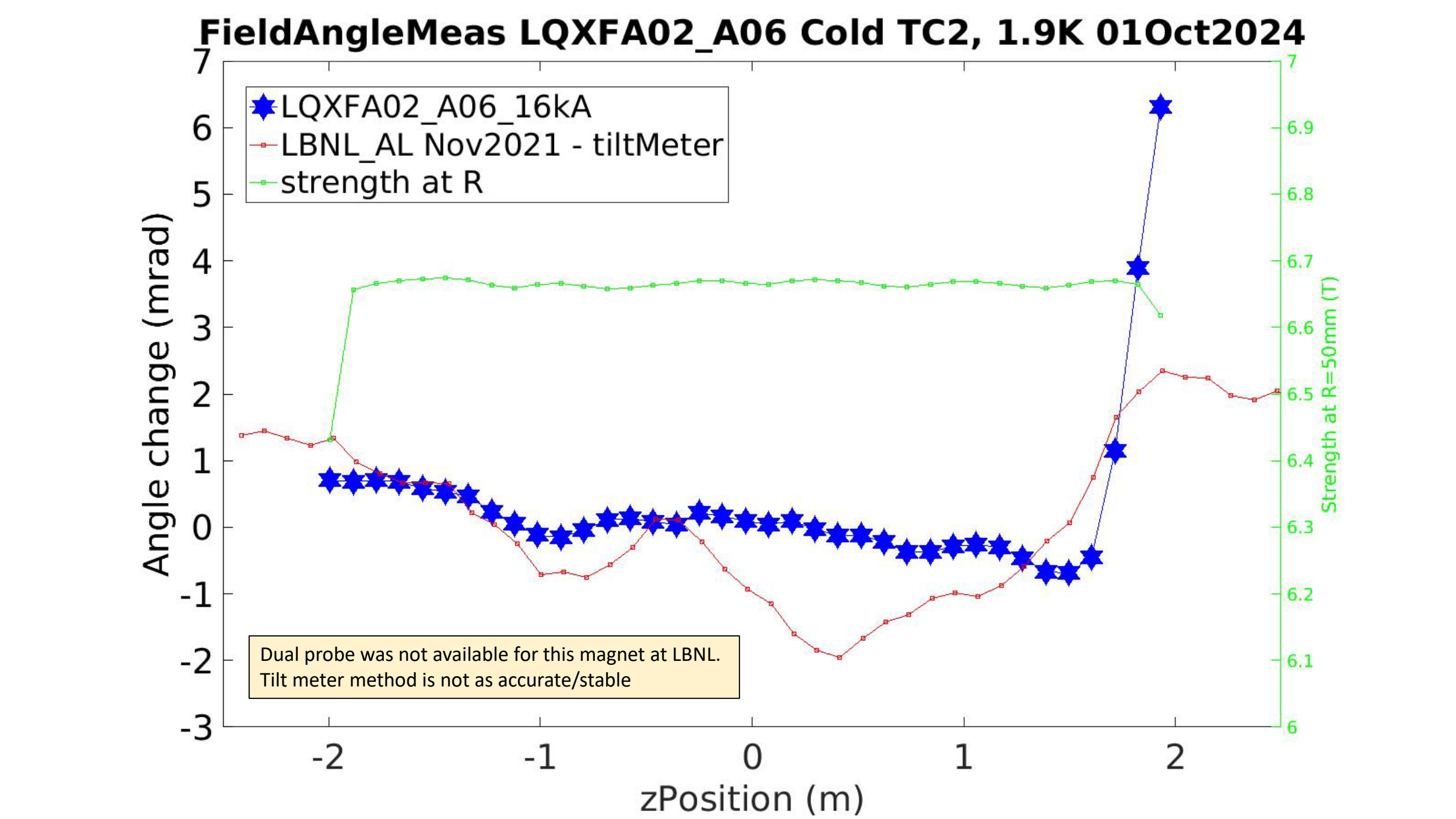

LQXFA02 Integrated harmonics
Nominal Current, 16233 A
Units at R=50mm
4
2
0
-2
-4
-6
b3
a3
b4
a4
b5
a5
b6
a6
b7
a7
b8
a8
b9
a9
b10
a10
Harmonic Coef.
A06_16.35kA_s1
A05_16.35kA_s1
BNL_A06_16kA
BNL_A05_16kA
TargetRange


LQXFA02 Integrated harmonics
Inj. Current, 960 A
A06_960A_s1
A05_960A_s1
TargetRange
target range not really adjusted…
Units at R=50mm
Harmonic Coef.
10
5
0
-5
-10
b3
a3
b4
a4
b5
a5
b6
a6
b7
a7
b8
a8
b9
a9
b10
a10

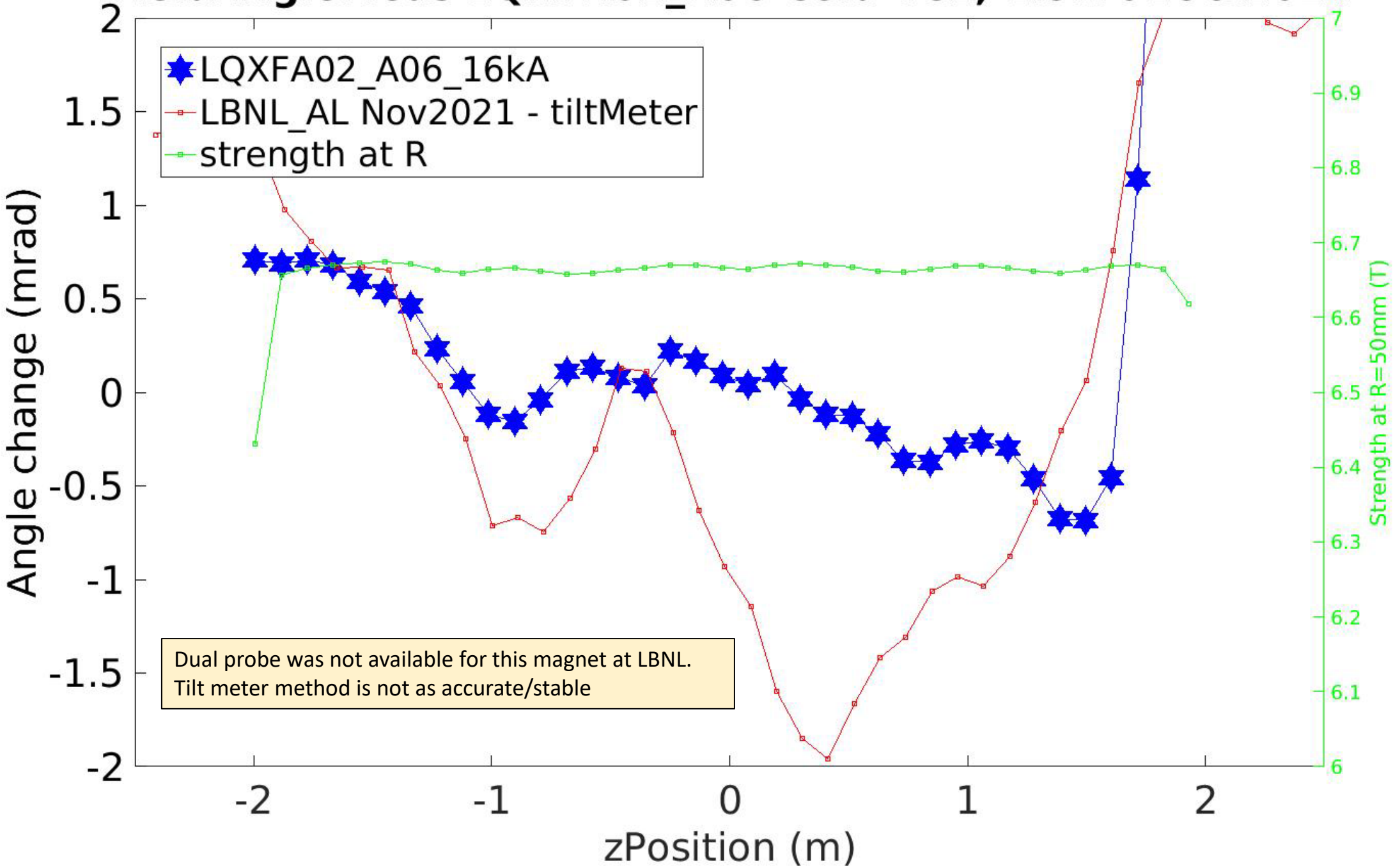
Field Angle


FieldAngleMeas LQXFA02_A05 Cold TC2, 1.9K 01Oct2024
LQXFA02_A05_16kA
LBNL_AL Feb2020
strength at R
Angle change (mrad)
zPosition (m)
Strength at R=50mm (T)
7
6
5
4
3
2
1
0
-1
-2
-3
-2
-1
0
1
2
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6

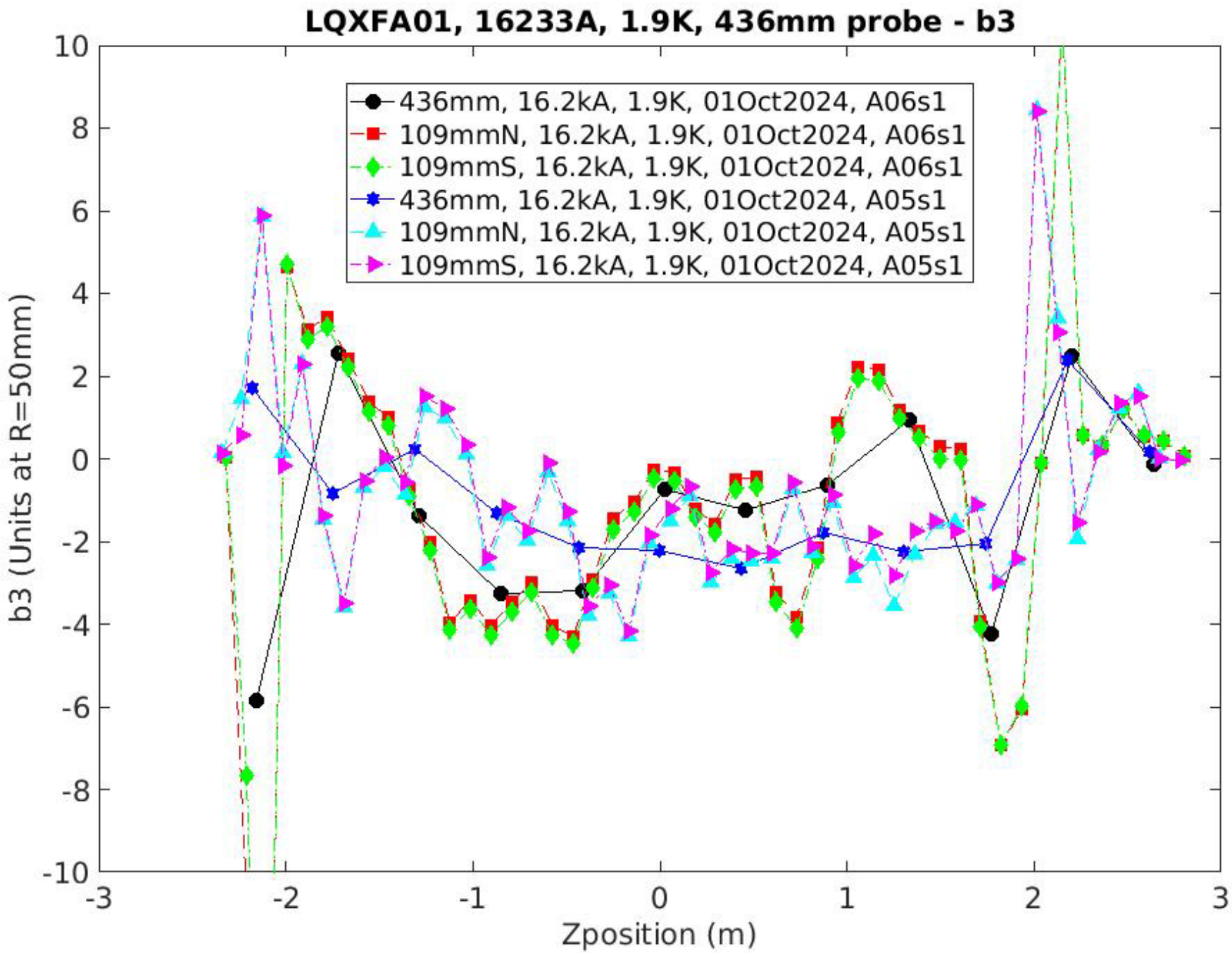

FieldAngleMeas LQXFA02_A05 Cold TC2, 1.9K 01Oct2024
LQXFA02_A05_16kA
LBNL_AL Feb2020
strength at R
Angle change (mrad)
zPosition (m)
Strength at R=50mm (T)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2
-1
0
1
2
7
6.9
6.8
6.7
6.6
6.5
6.4
6.3
6.2
6.1
6

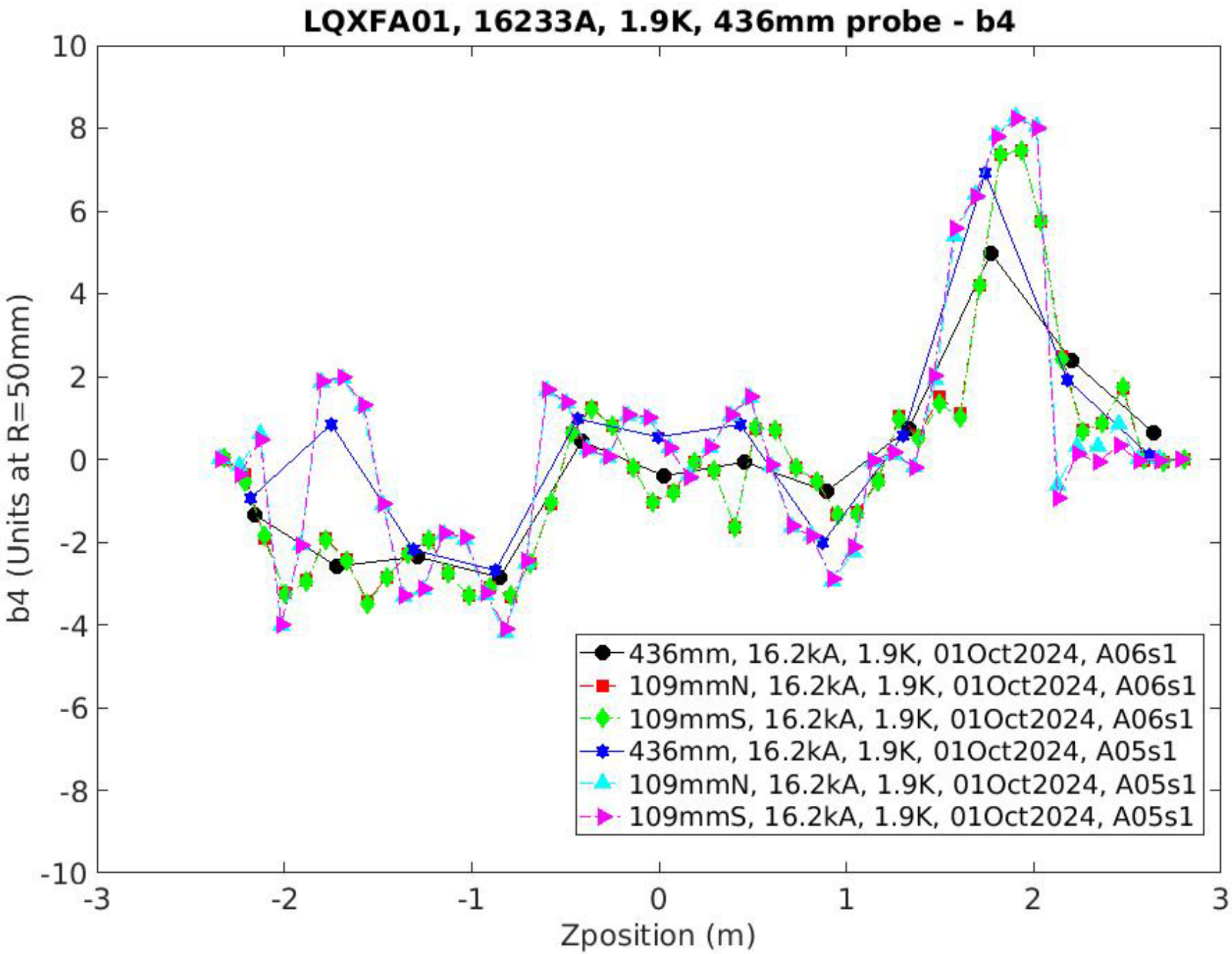

FieldAngleMeas LQXFA02_A06 Cold TC2, 1.9K 01Oct2024
LQXFA02_A06_16kA
LBNL_AL Nov2021 - tiltMeter
strength at R
Angle change (mrad)
Strength at R=50mm (T)
zPosition (m)
Dual probe was not available for this magnet at LBNL.
Tilt meter method is not as accurate/stable

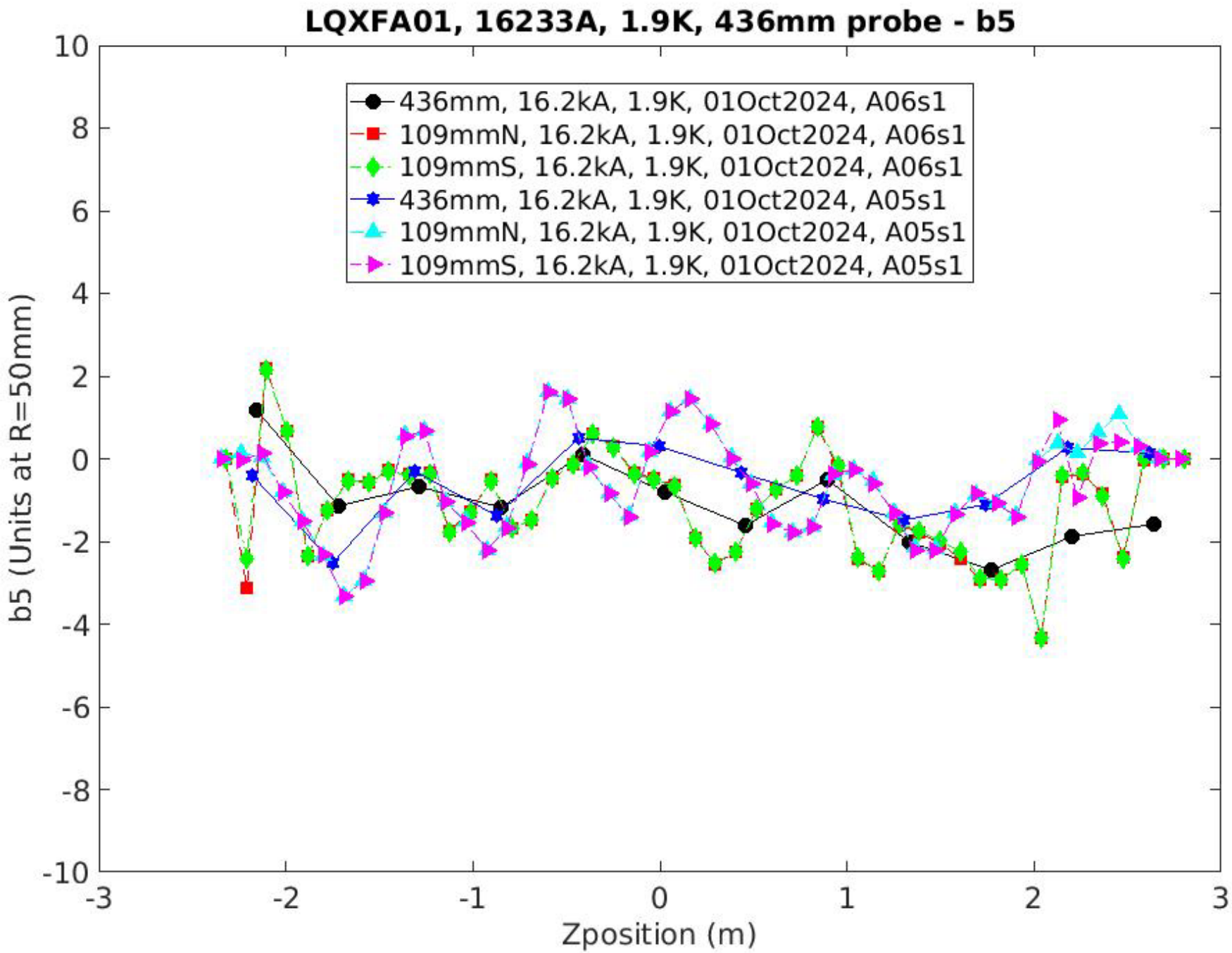
FieldAngleMeas LQXFA02_A06 Cold TC2, 1.9K 01Oct2024

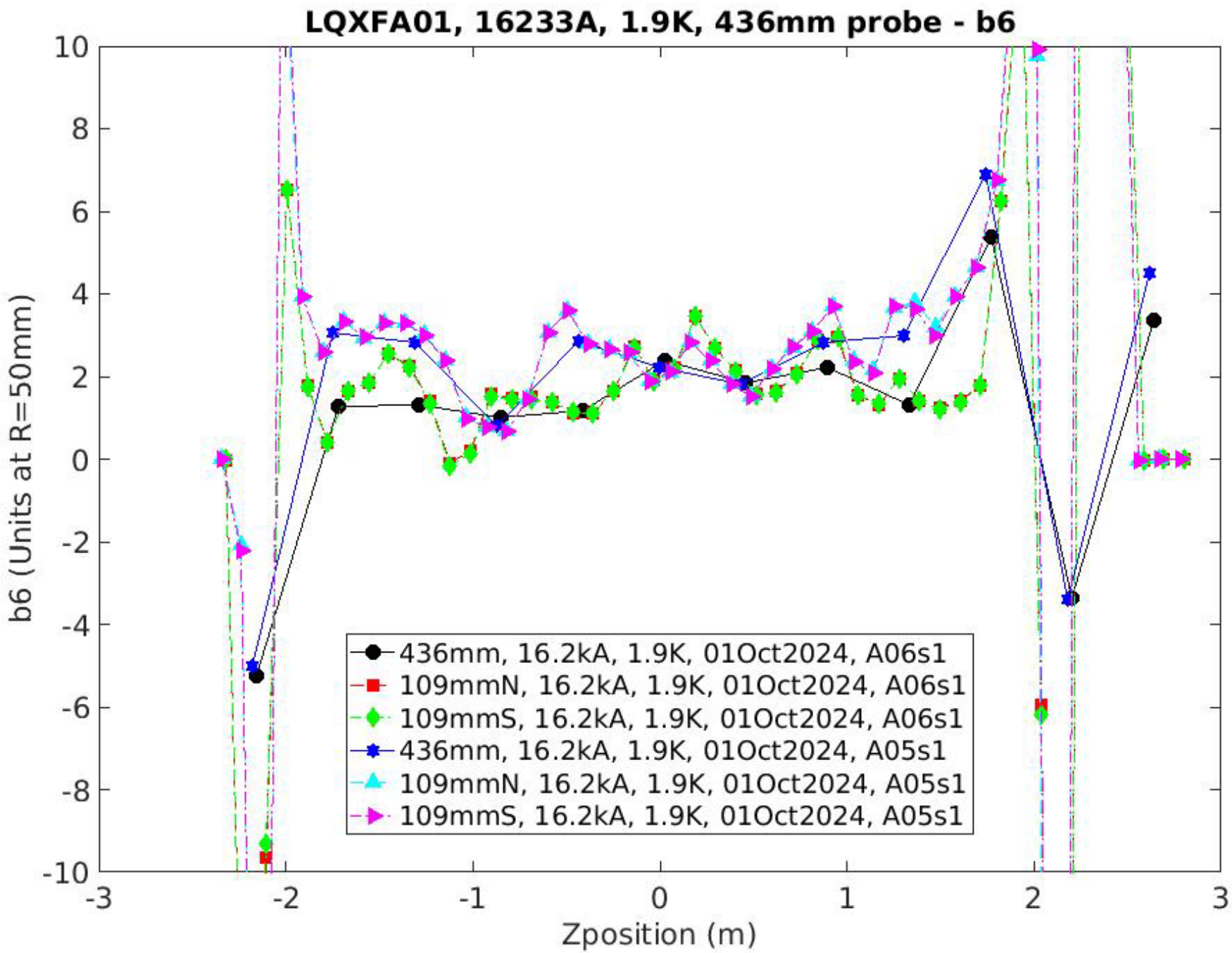


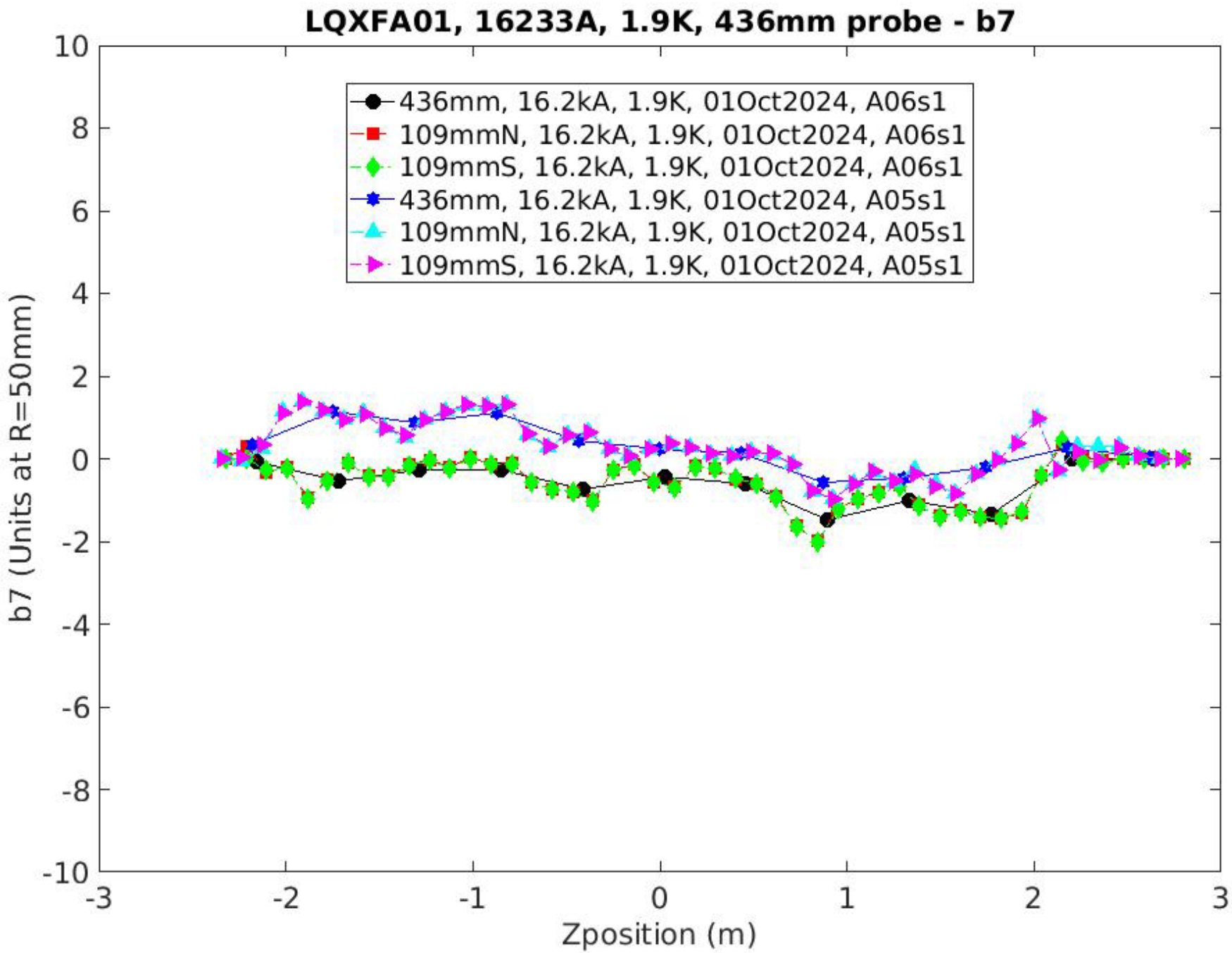
16235A zscan Normal harmonics

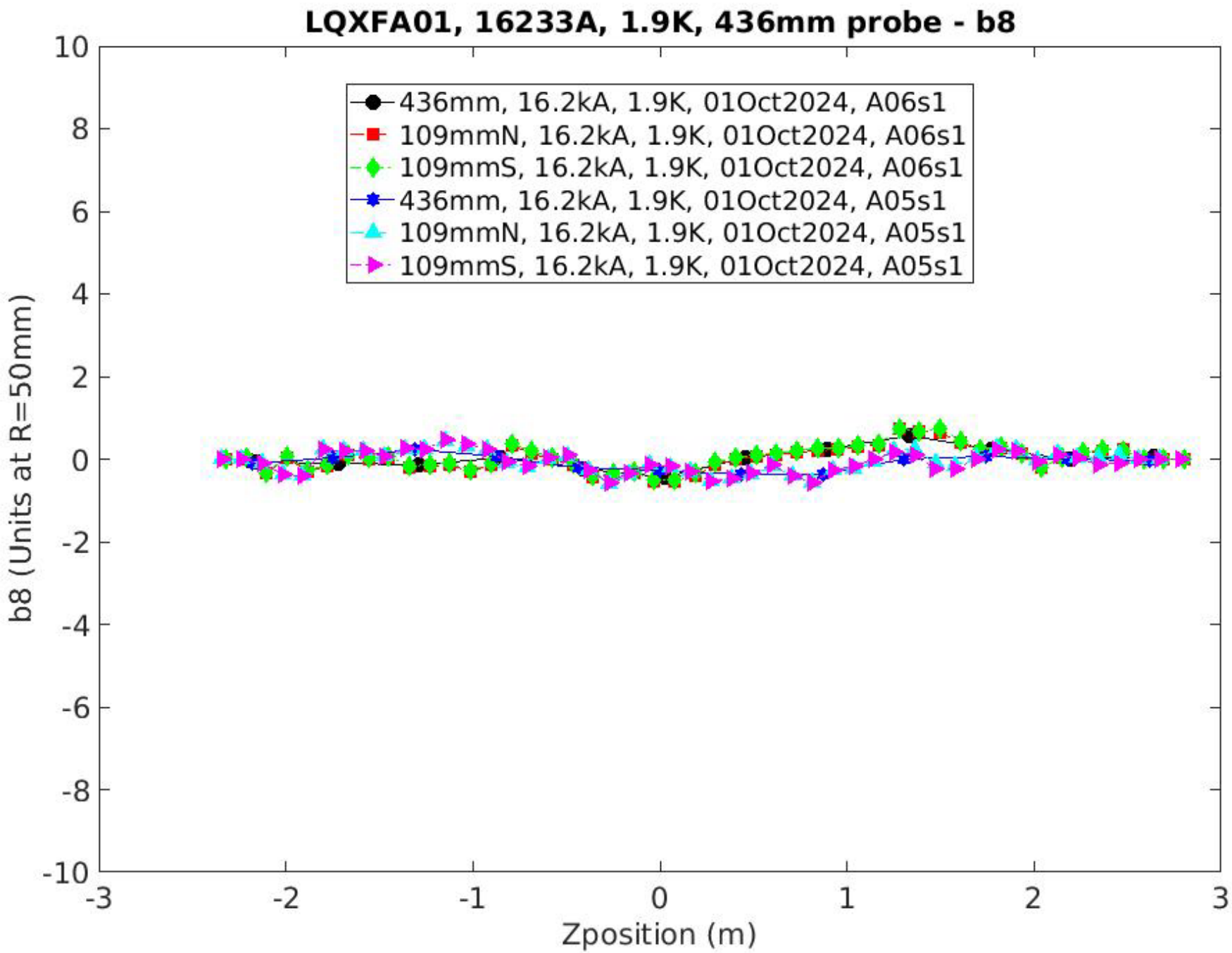

LQXFA01, 16233A, 1.9K, 436mm probe - b3
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
b3 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

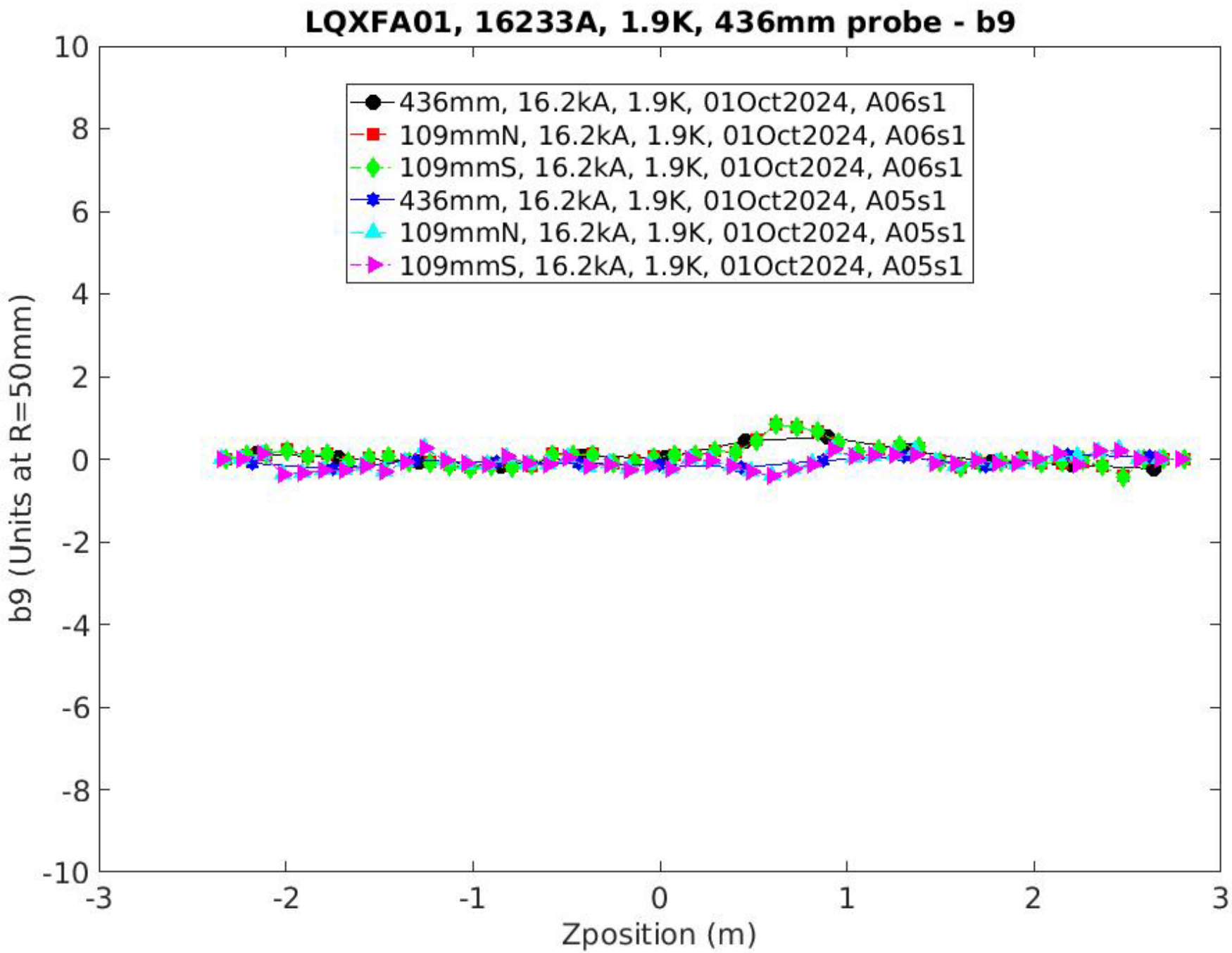

LQXFA01, 16233A, 1.9K, 436mm probe - b4
b4 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1

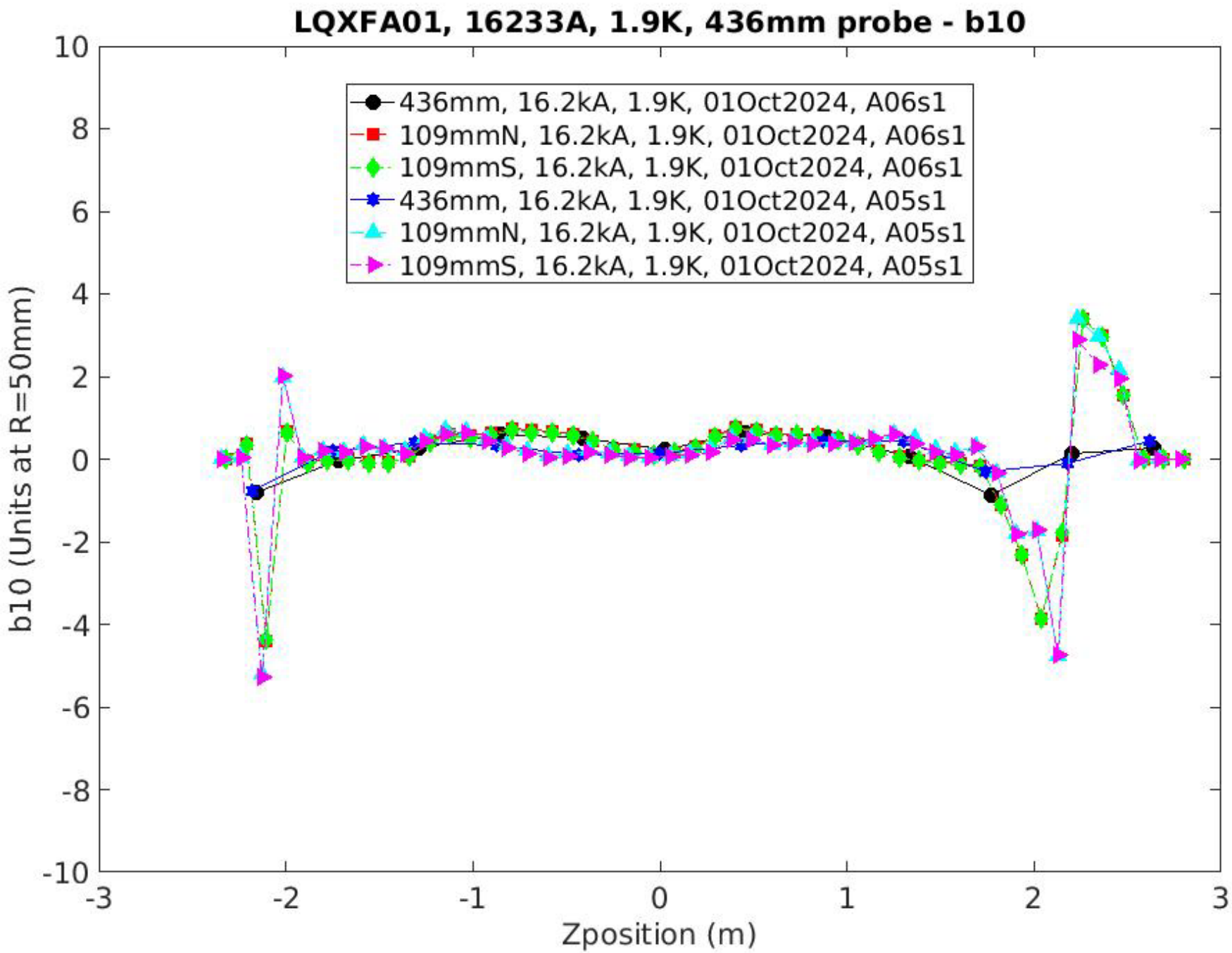

LQXFA01, 16233A, 1.9K, 436mm probe - b5
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
b5 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

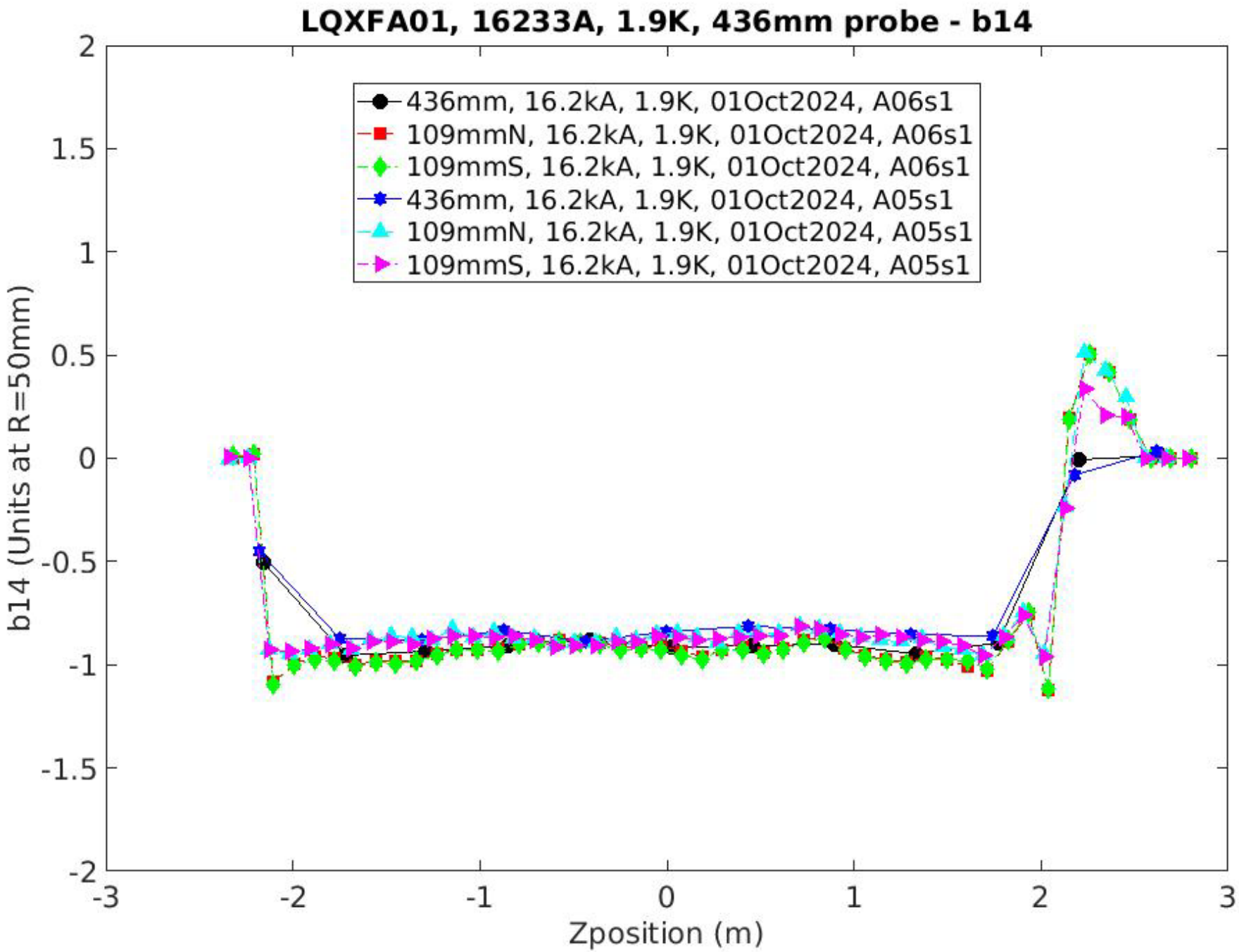

LQXFA01, 16233A, 1.9K, 436mm probe - b6
b6 (Units at R=50mm)
Zposition (m)
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1


LQXFA01, 16233A, 1.9K, 436mm probe - b7
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
b7 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

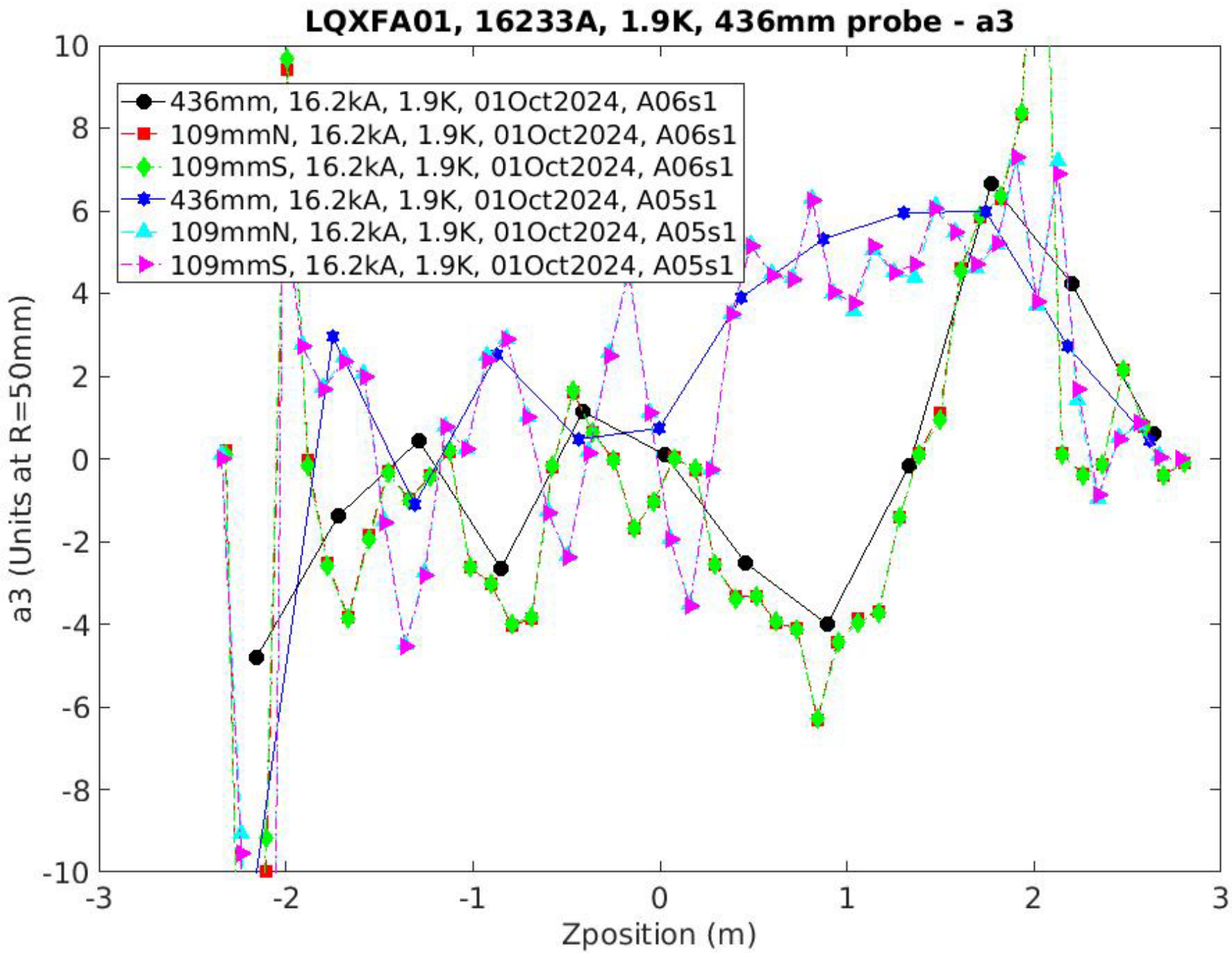

LQXFA01, 16233A, 1.9K, 436mm probe - b8
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
b8 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

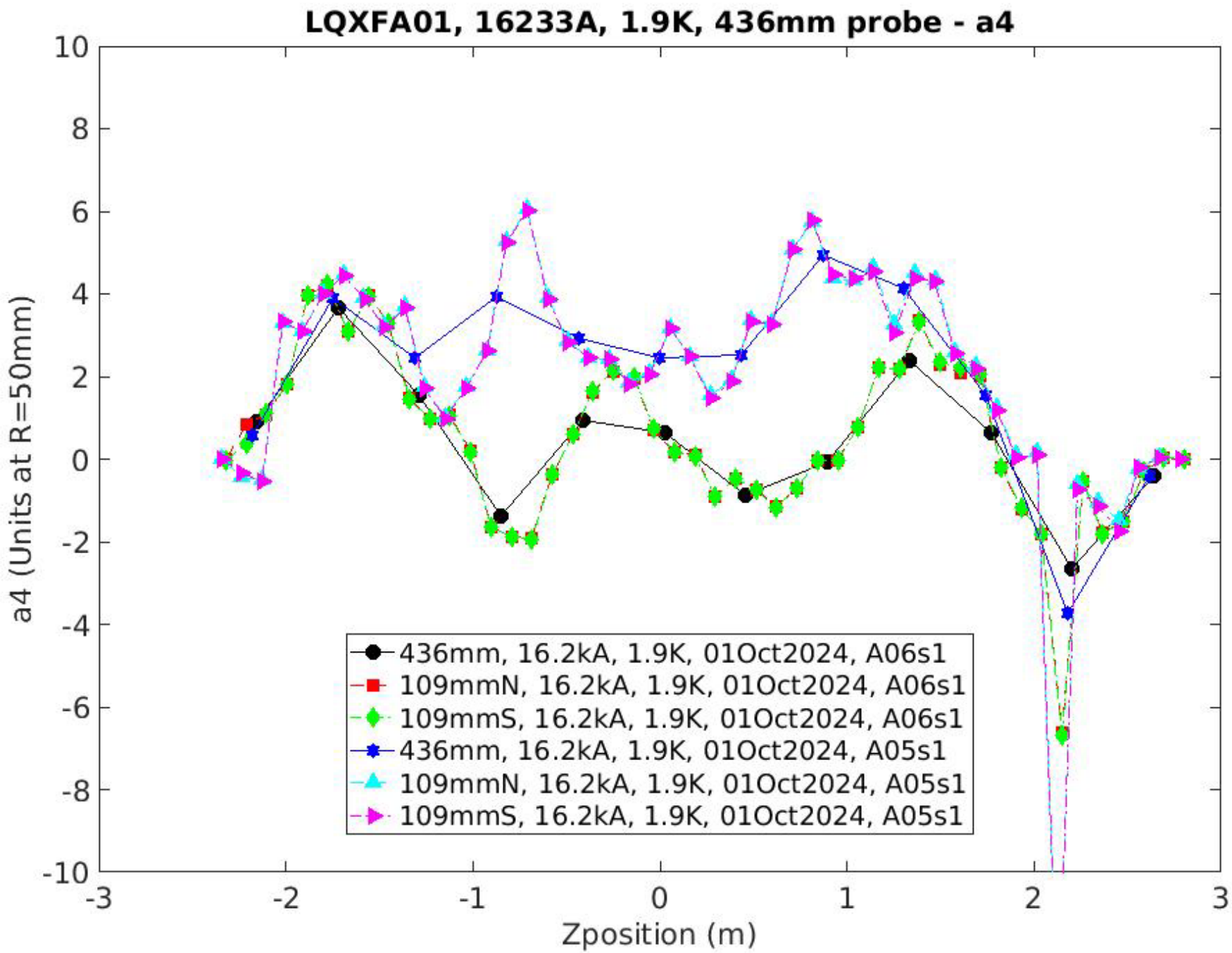

LQXFA01, 16233A, 1.9K, 436mm probe - b9
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
b9 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

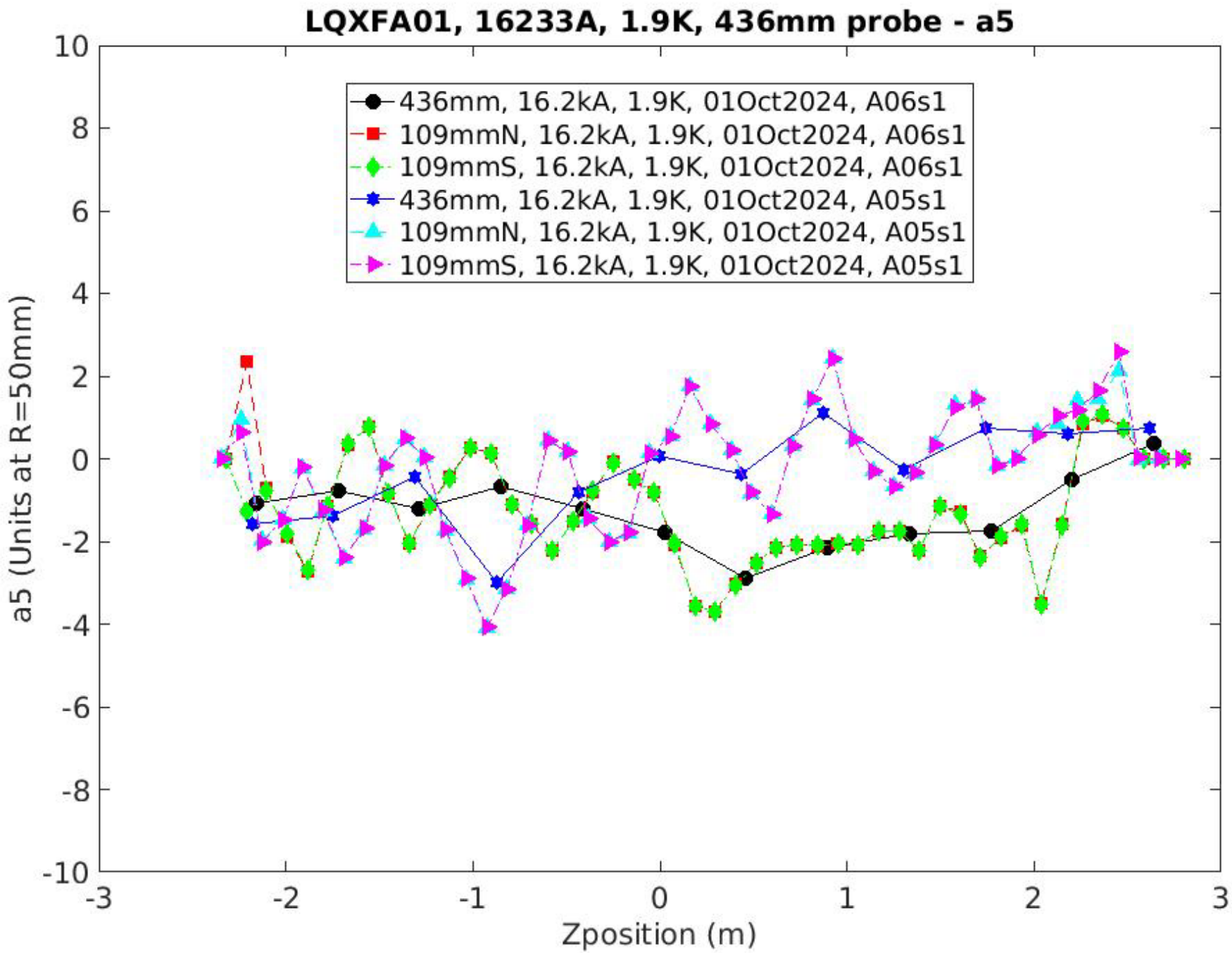

LQXFA01, 16233A, 1.9K, 436mm probe - b10
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
b10 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

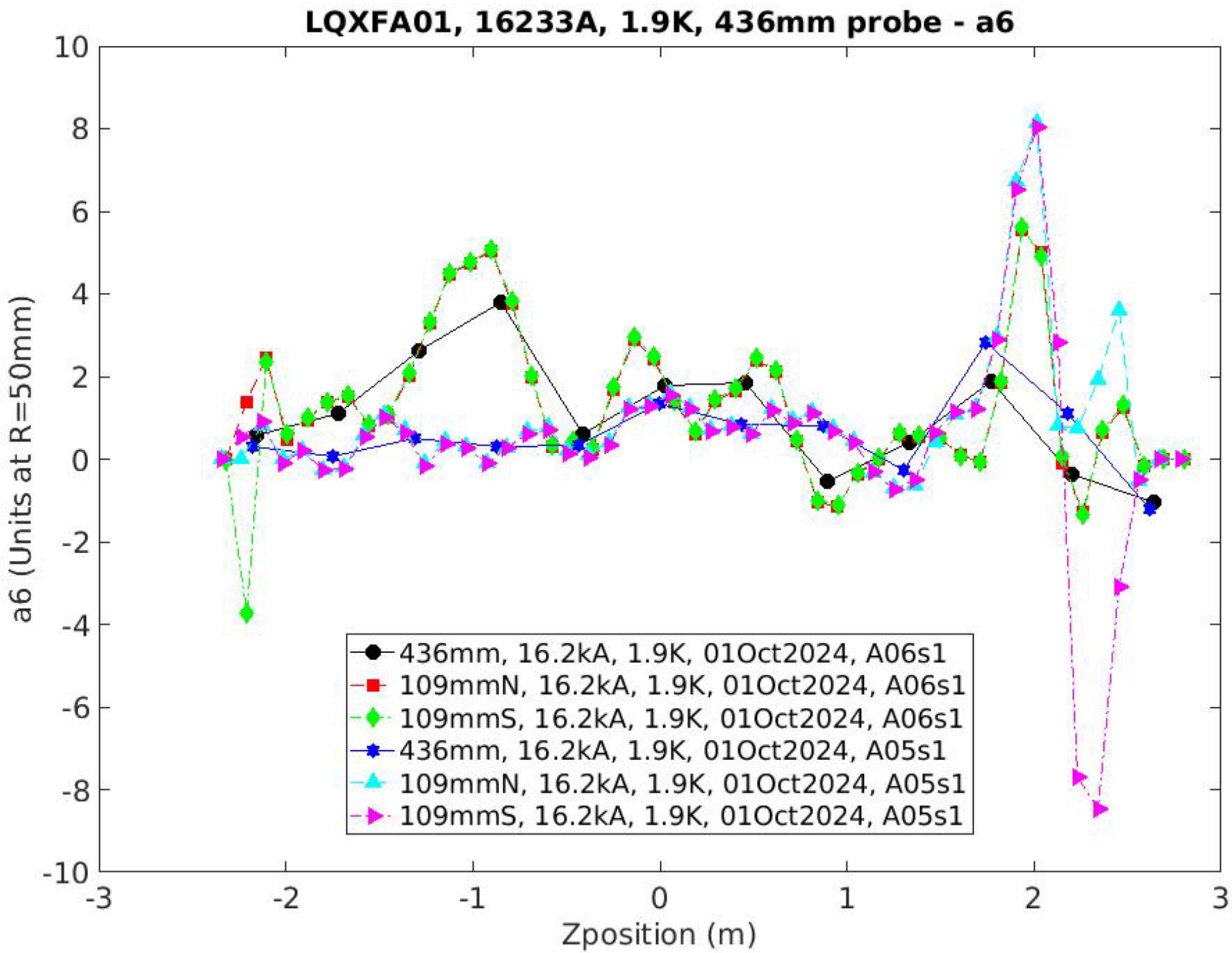

LQXFA01, 16233A, 1.9K, 436mm probe - b14
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
b14 (Units at R=50mm)
Zposition (m)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-3
-2
-1
0
1
2
3

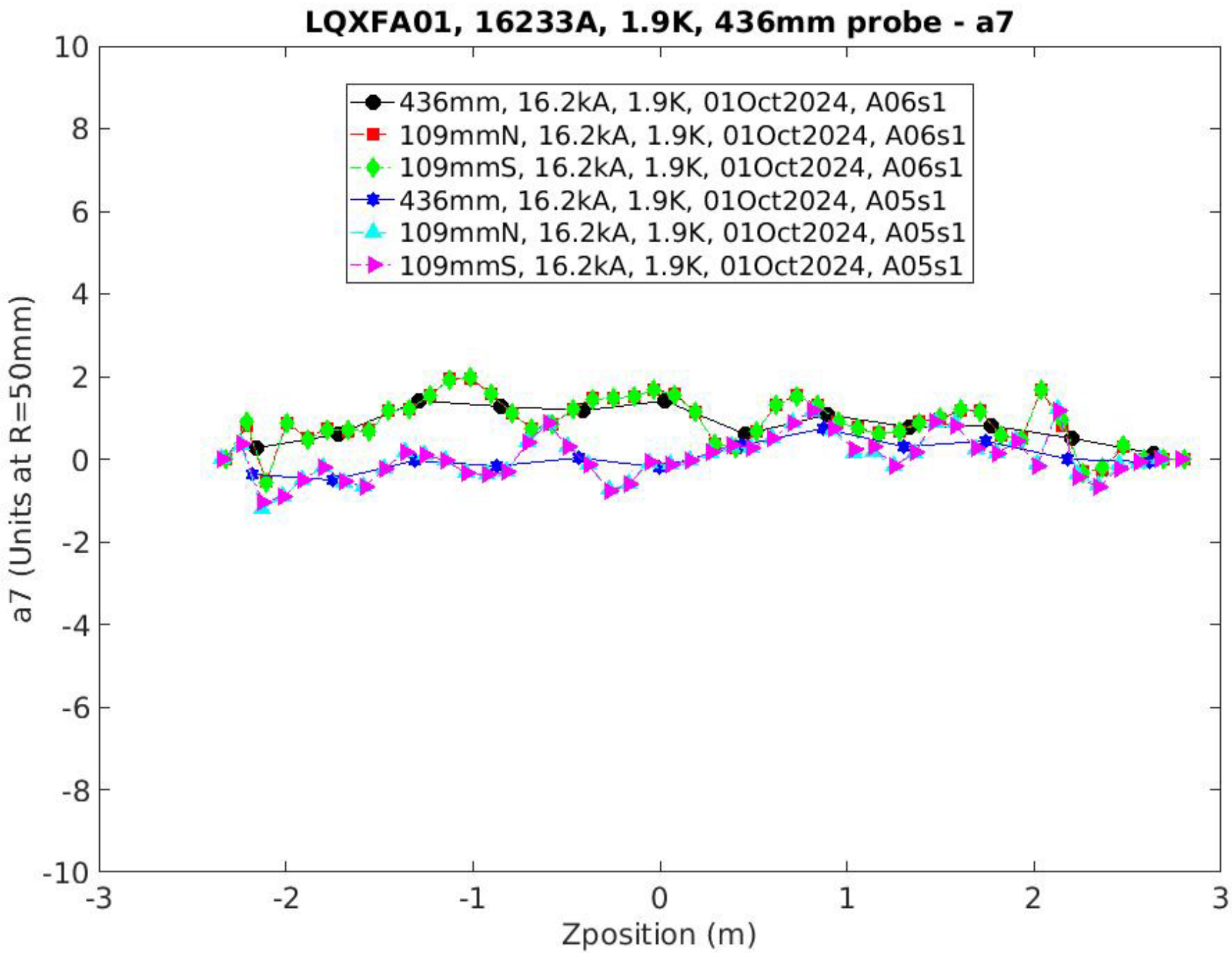
16235A zscan Skew harmonics

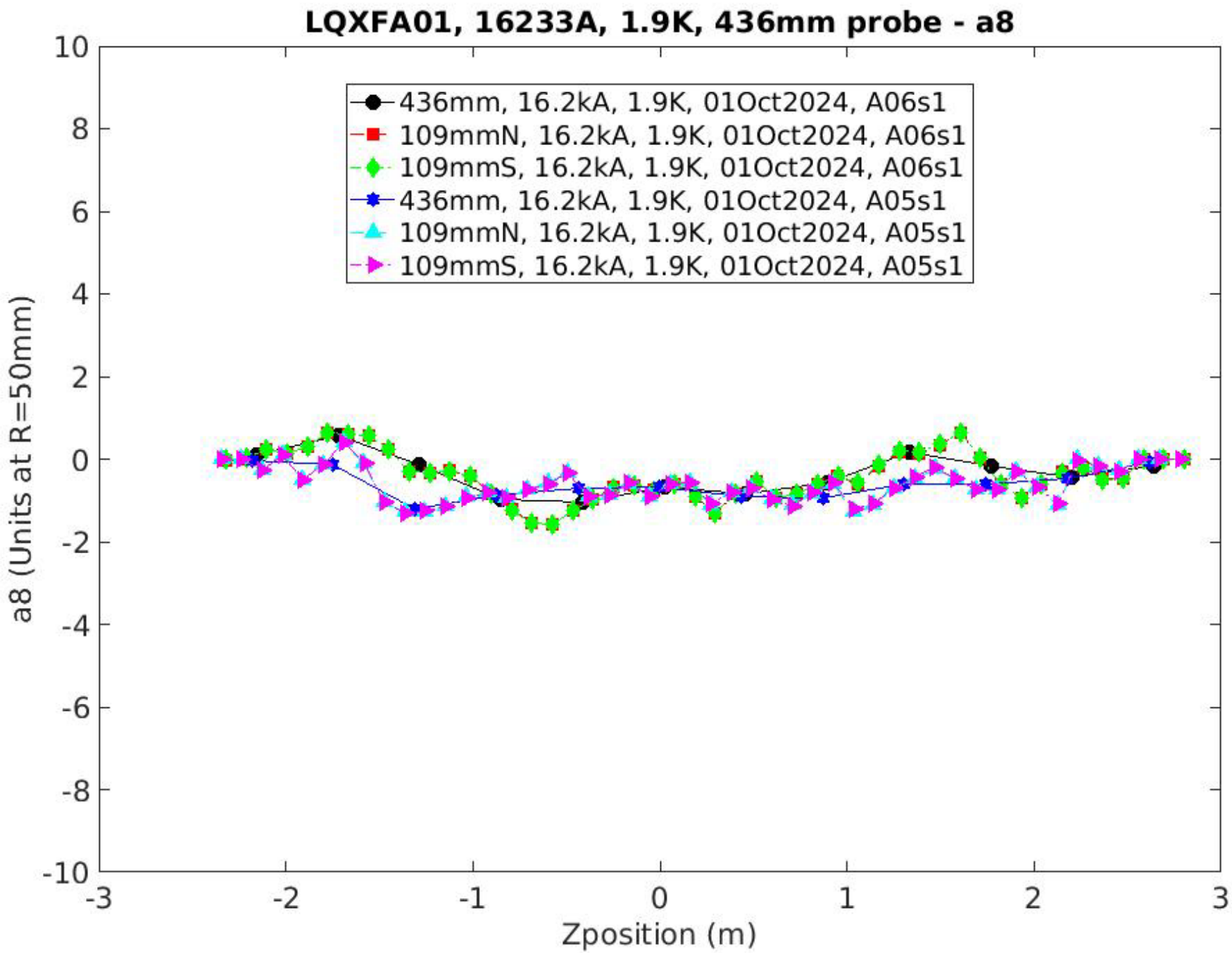

LQXFA01, 16233A, 1.9K, 436mm probe - a3
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
a3 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

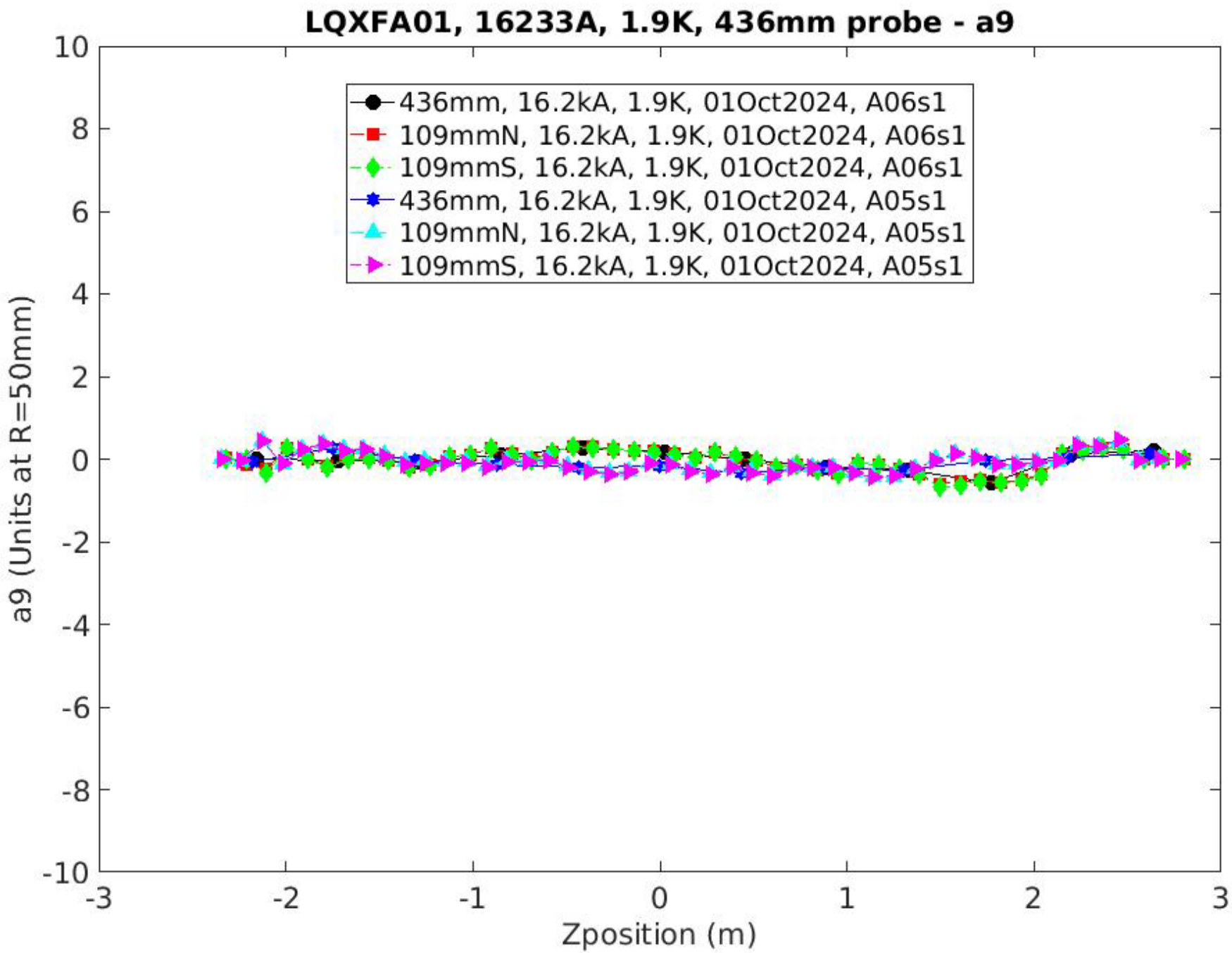

LQXFA01, 16233A, 1.9K, 436mm probe - a4
a4 (Units at R=50mm)
Zposition (m)
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1

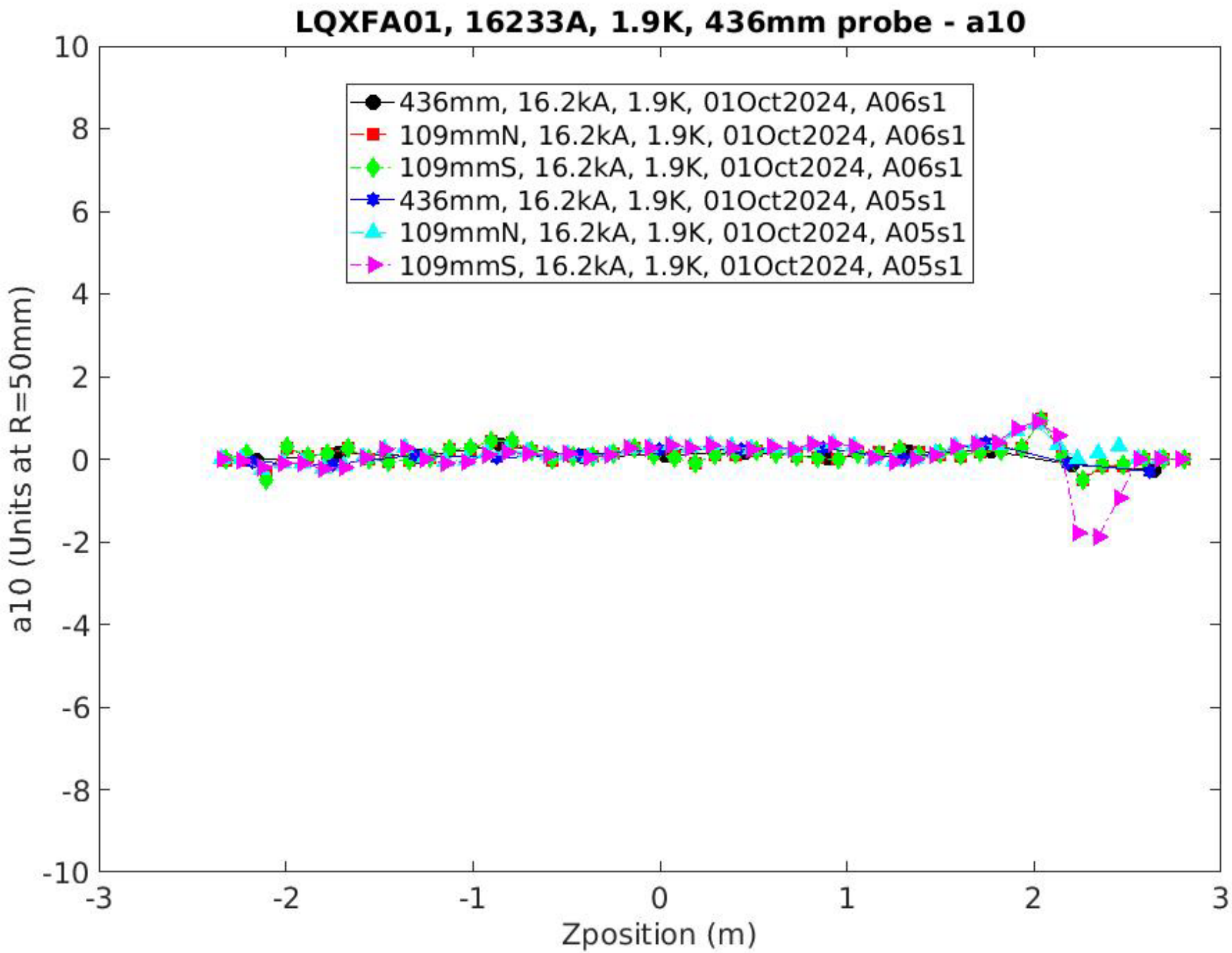

LQXFA01, 16233A, 1.9K, 436mm probe - a5
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
a5 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3


LQXFA01, 16233A, 1.9K, 436mm probe - a6
a6 (Units at R=50mm)
Zposition (m)
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1

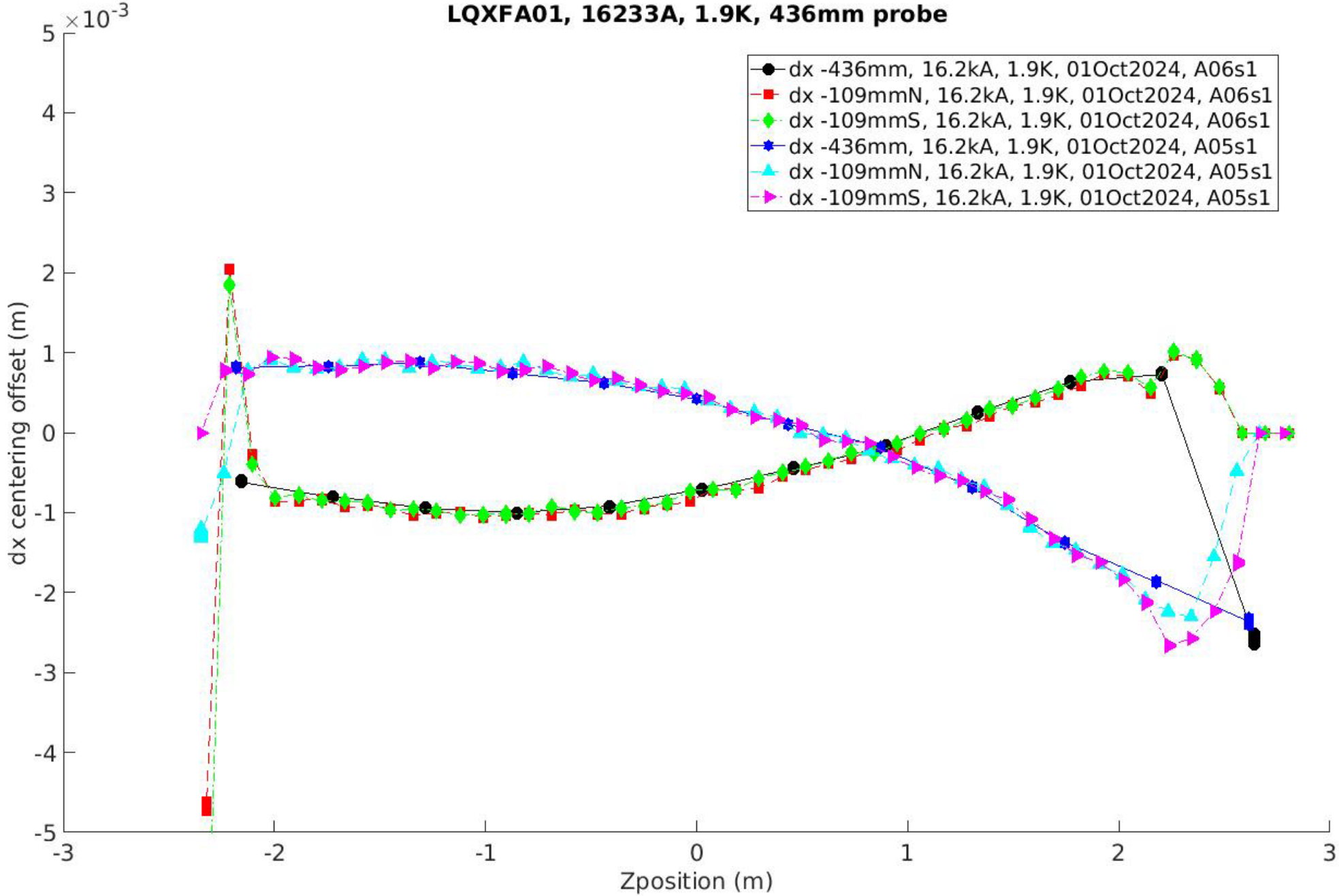

LQXFA01, 16233A, 1.9K, 436mm probe - a7
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
a7 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

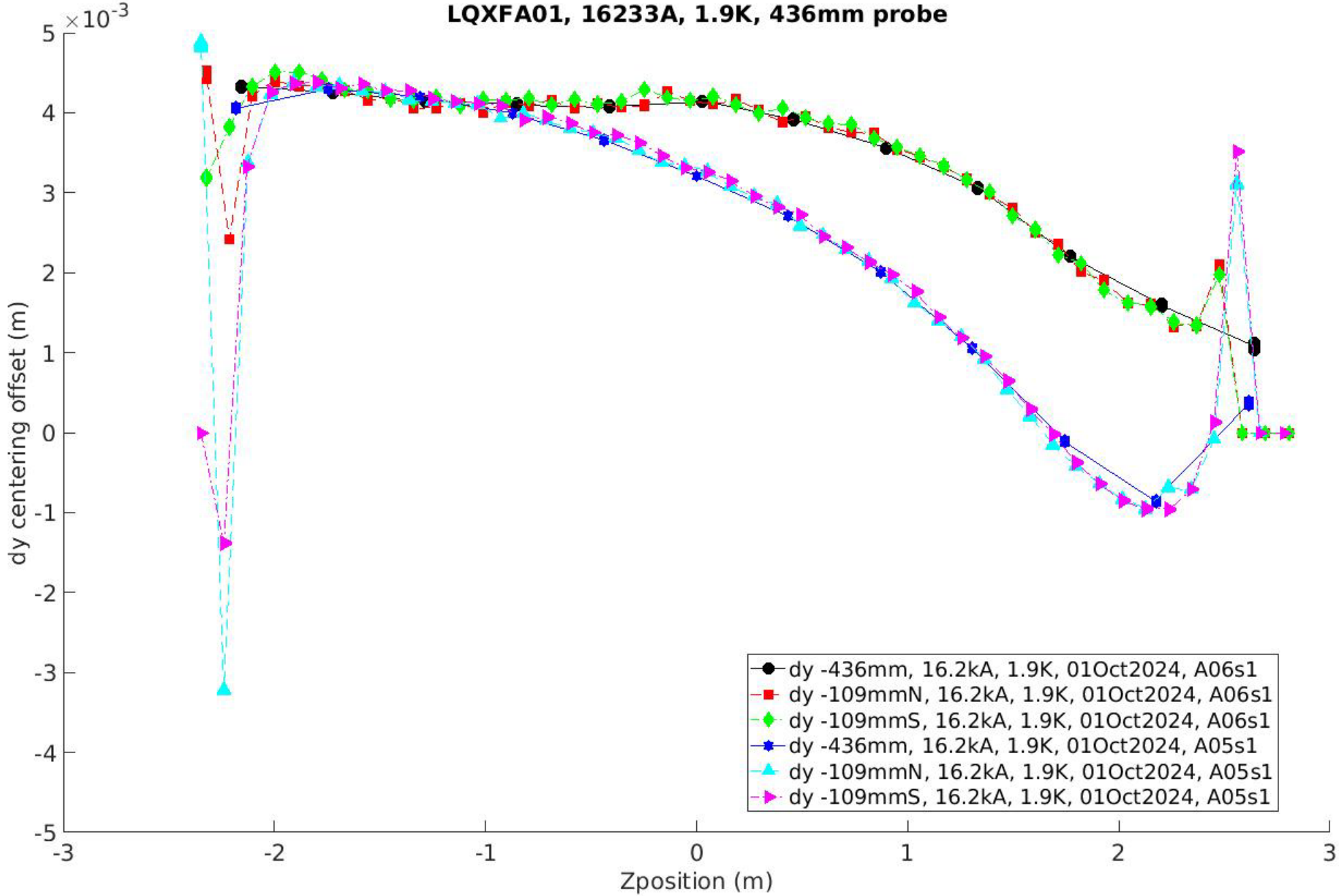

LQXFA01, 16233A, 1.9K, 436mm probe - a8
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
a8 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

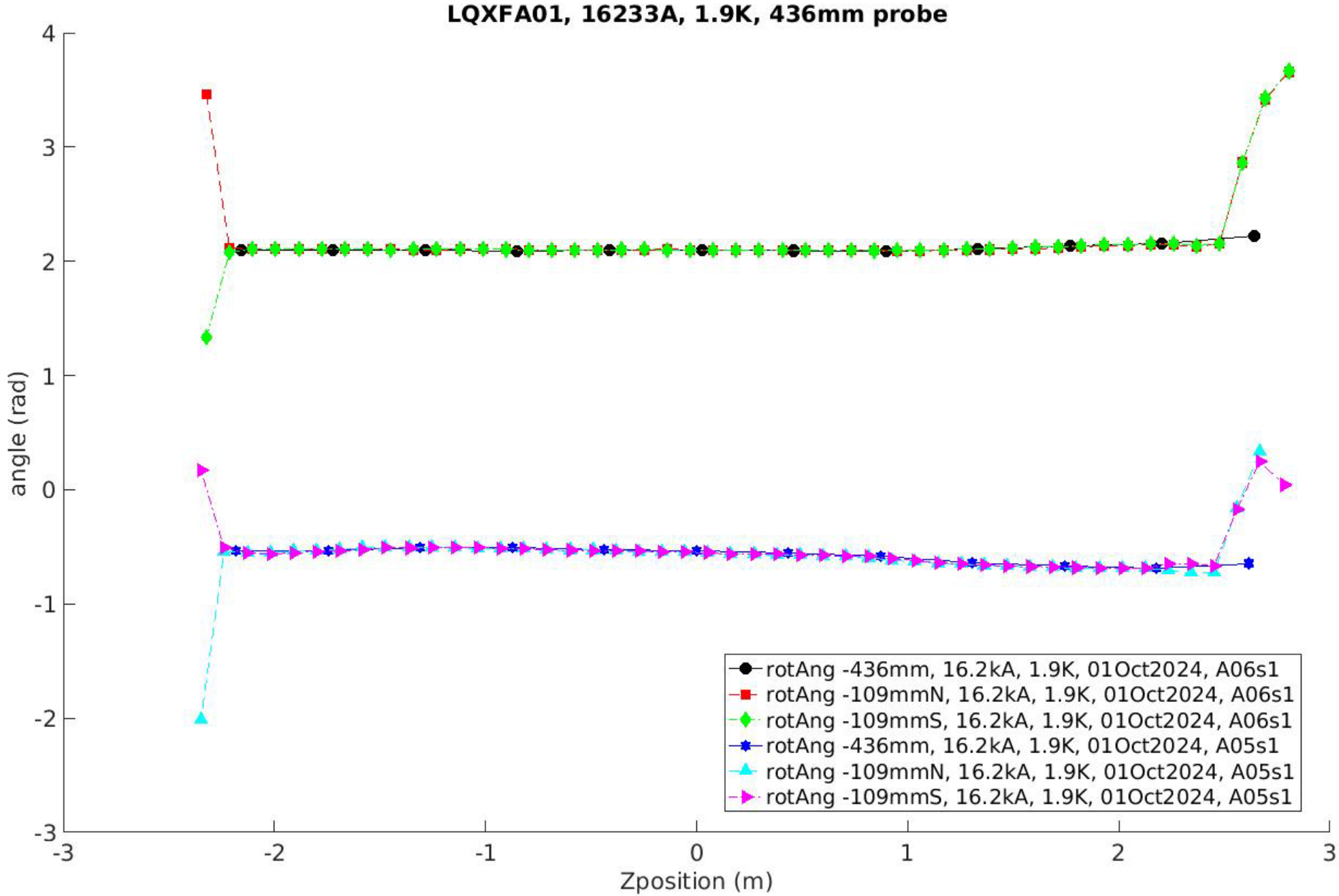

LQXFA01, 16233A, 1.9K, 436mm probe - a9
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
a9 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3


LQXFA01, 16233A, 1.9K, 436mm probe - a10
436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1
a10 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

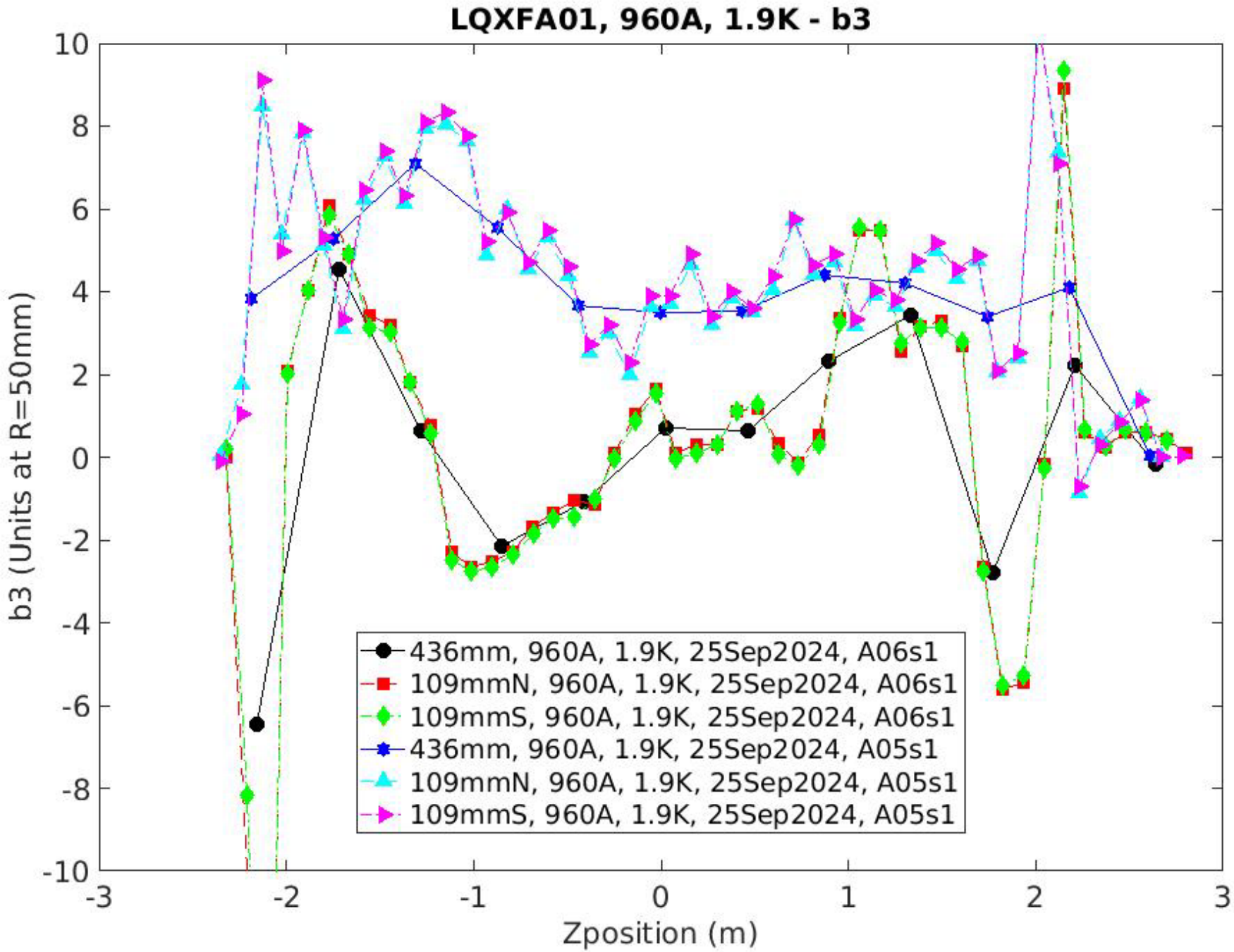
Other

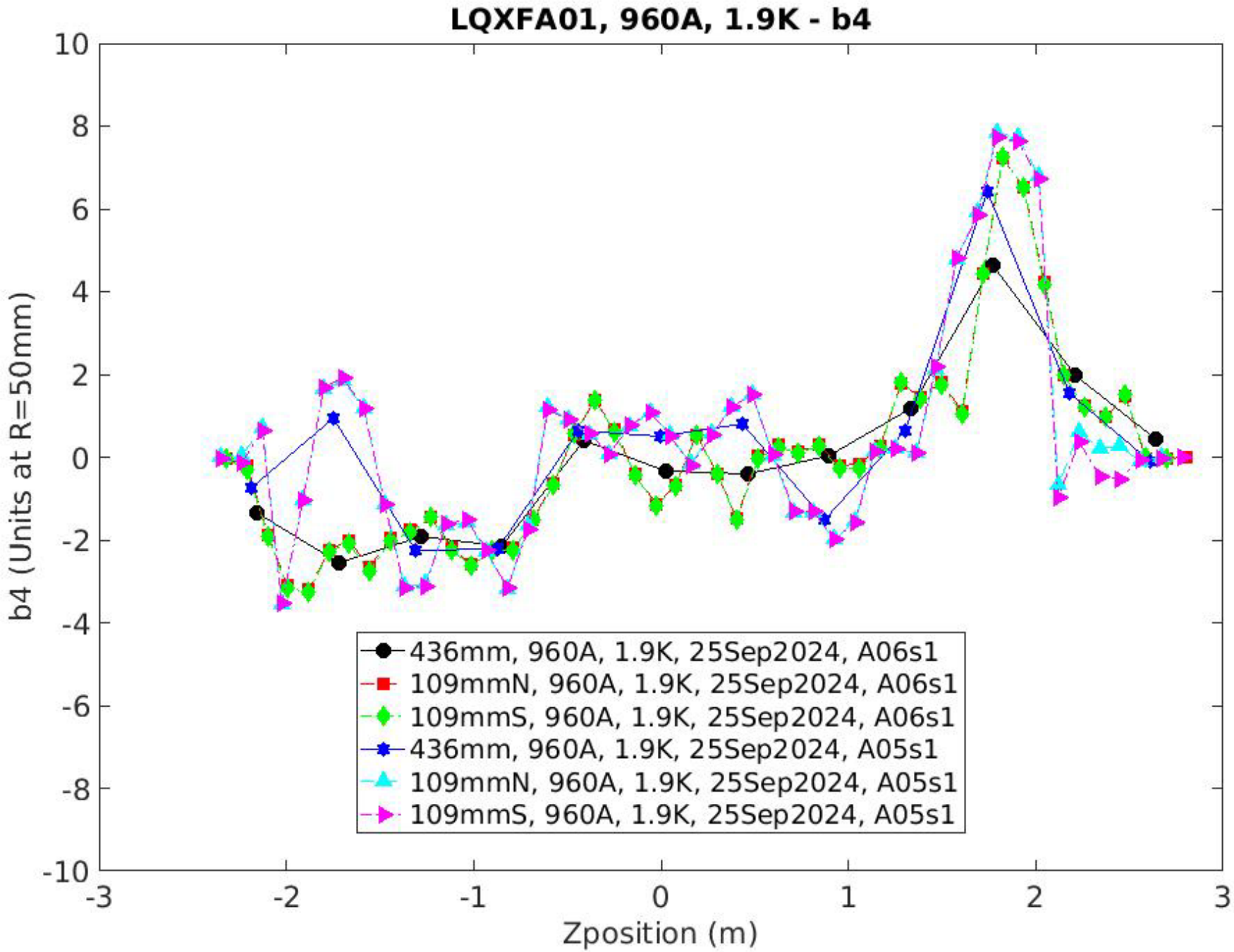

LQXFA01, 16233A, 1.9K, 436mm probe
×10^-3
dx centering offset (m)
Zposition (m)
dx -436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
dx -109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
dx -109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
dx -436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
dx -109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
dx -109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1

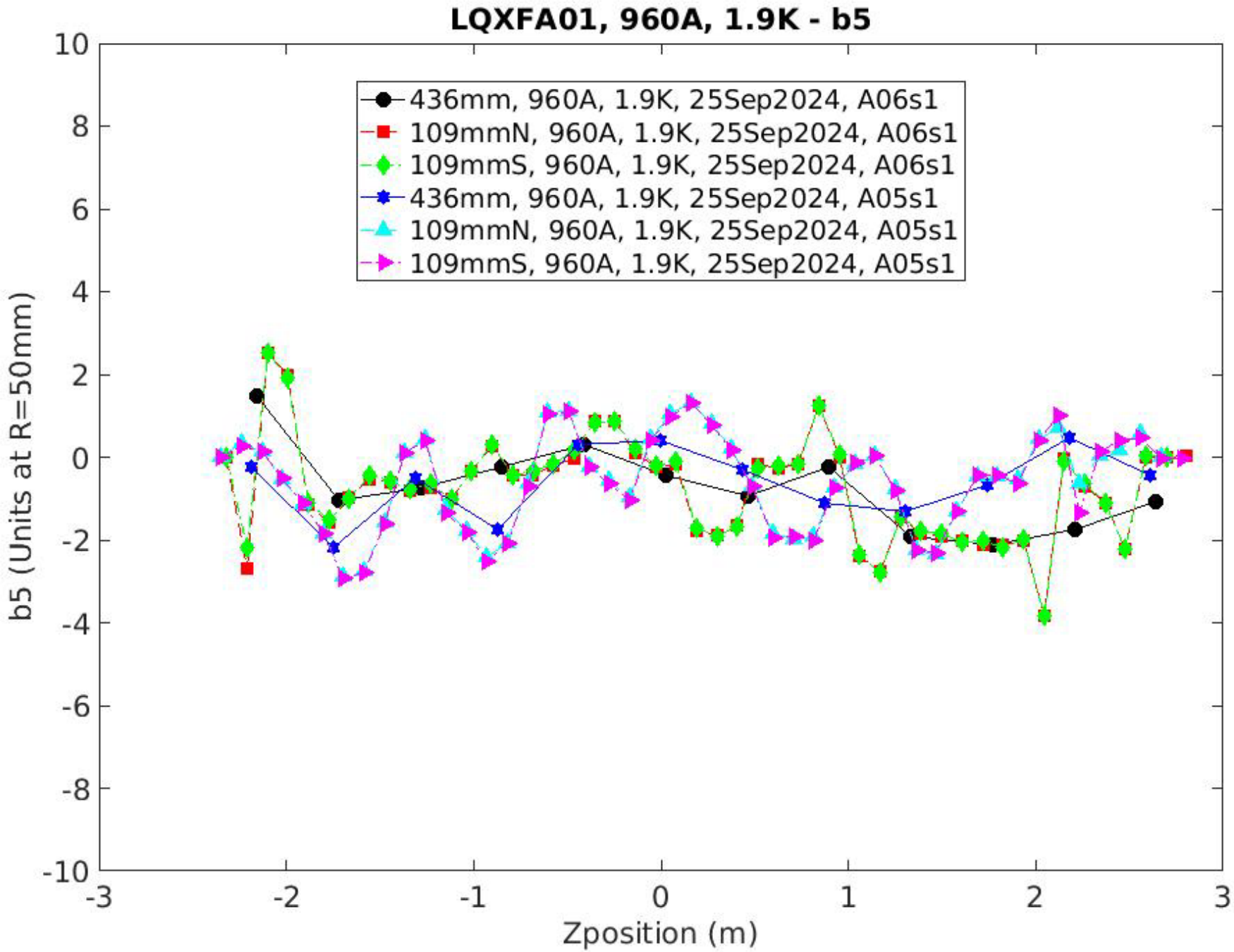

LQXFA01, 16233A, 1.9K, 436mm probe
×10^-3
dy centering offset (m)
Zposition (m)
dy -436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
dy -109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
dy -109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
dy -436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
dy -109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
dy -109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1

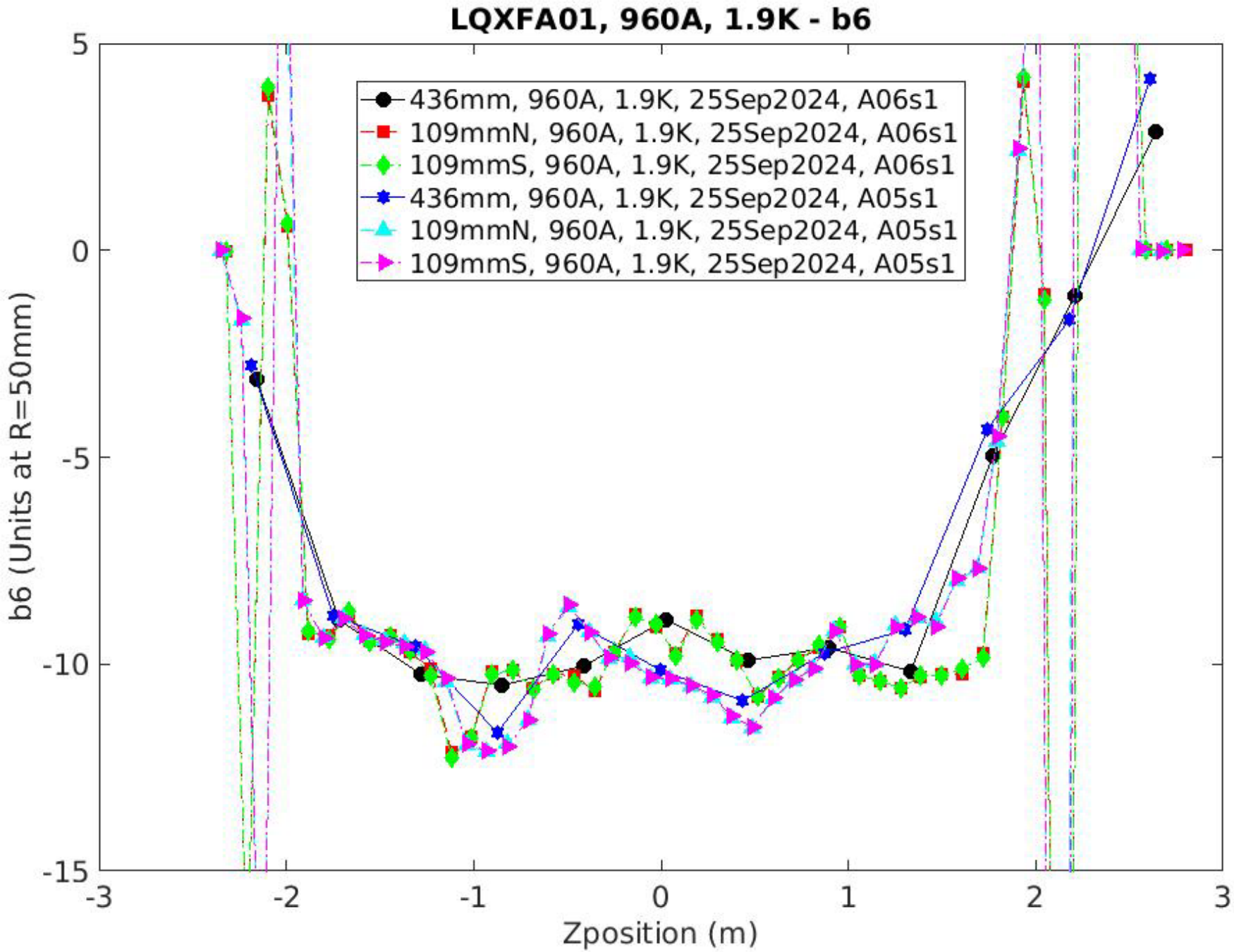

LQXFA01, 16233A, 1.9K, 436mm probe
angle (rad)
Zposition (m)
4
3
2
1
0
-1
-2
-3
-3
-2
-1
0
1
2
3
rotAng -436mm, 16.2kA, 1.9K, 01Oct2024, A06s1
rotAng -109mmN, 16.2kA, 1.9K, 01Oct2024, A06s1
rotAng -109mmS, 16.2kA, 1.9K, 01Oct2024, A06s1
rotAng -436mm, 16.2kA, 1.9K, 01Oct2024, A05s1
rotAng -109mmN, 16.2kA, 1.9K, 01Oct2024, A05s1
rotAng -109mmS, 16.2kA, 1.9K, 01Oct2024, A05s1

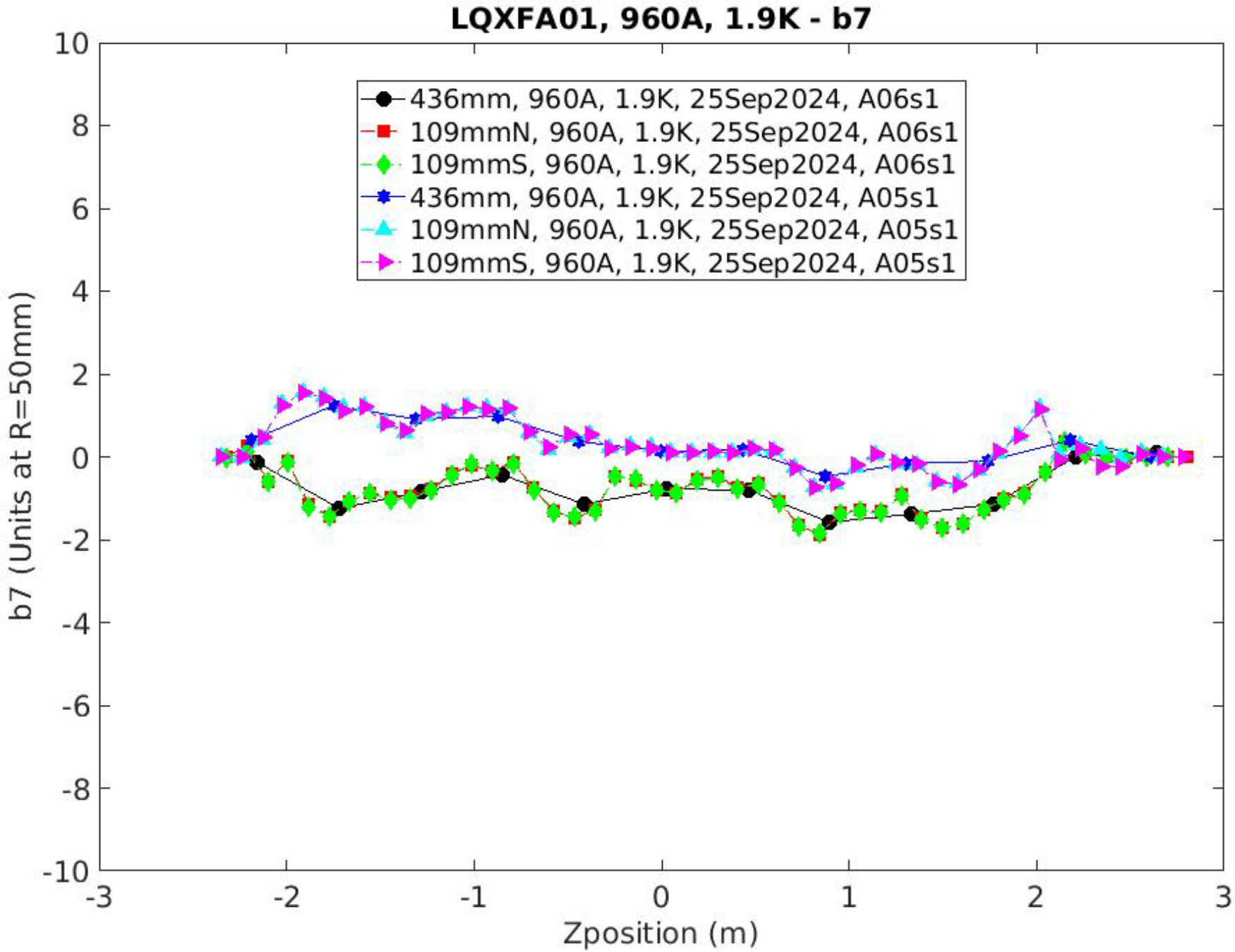
960A zscan Normal harmonics

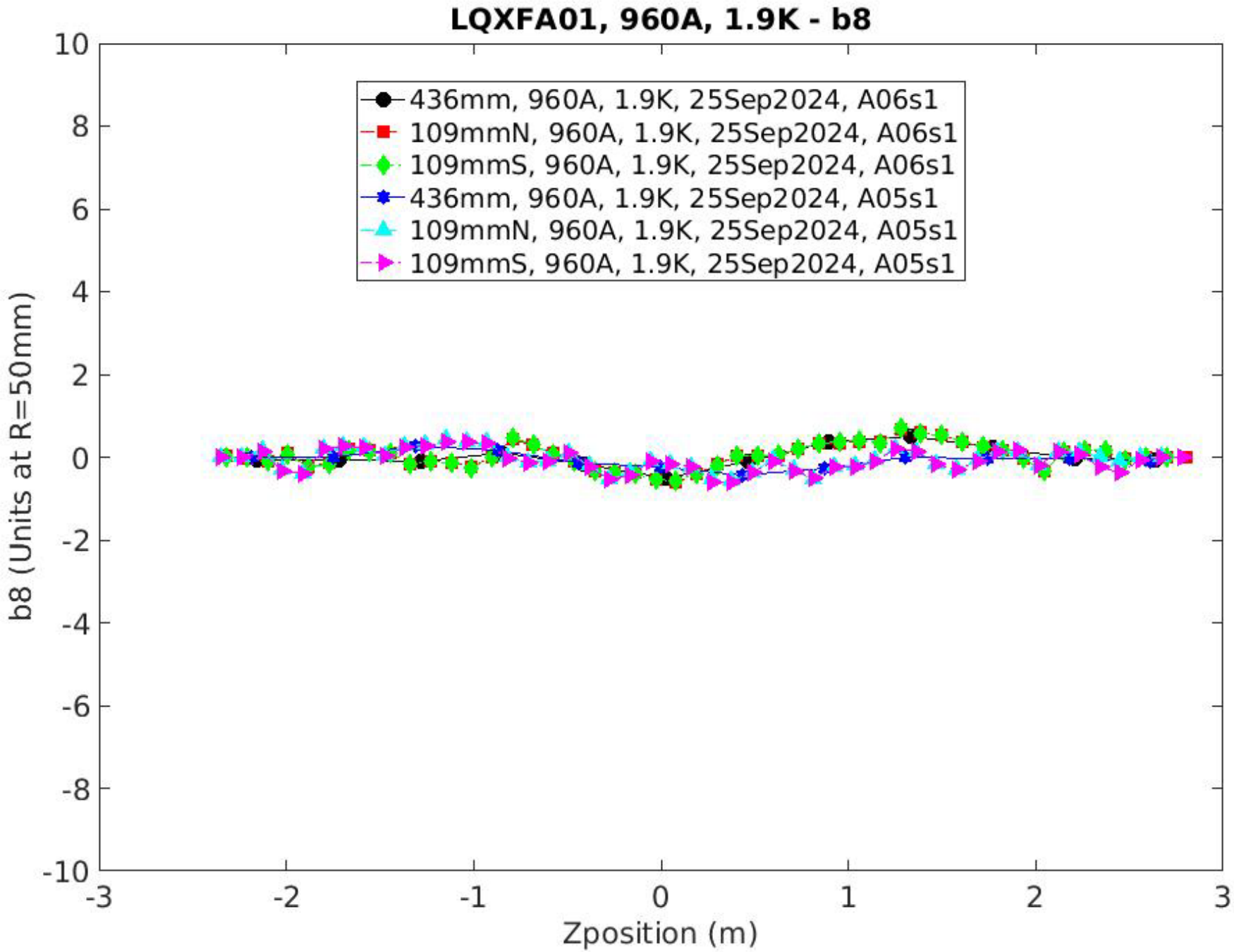

LQXFA01, 960A, 1.9K - b3
b3 (Units at R=50mm)
Zposition (m)
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1

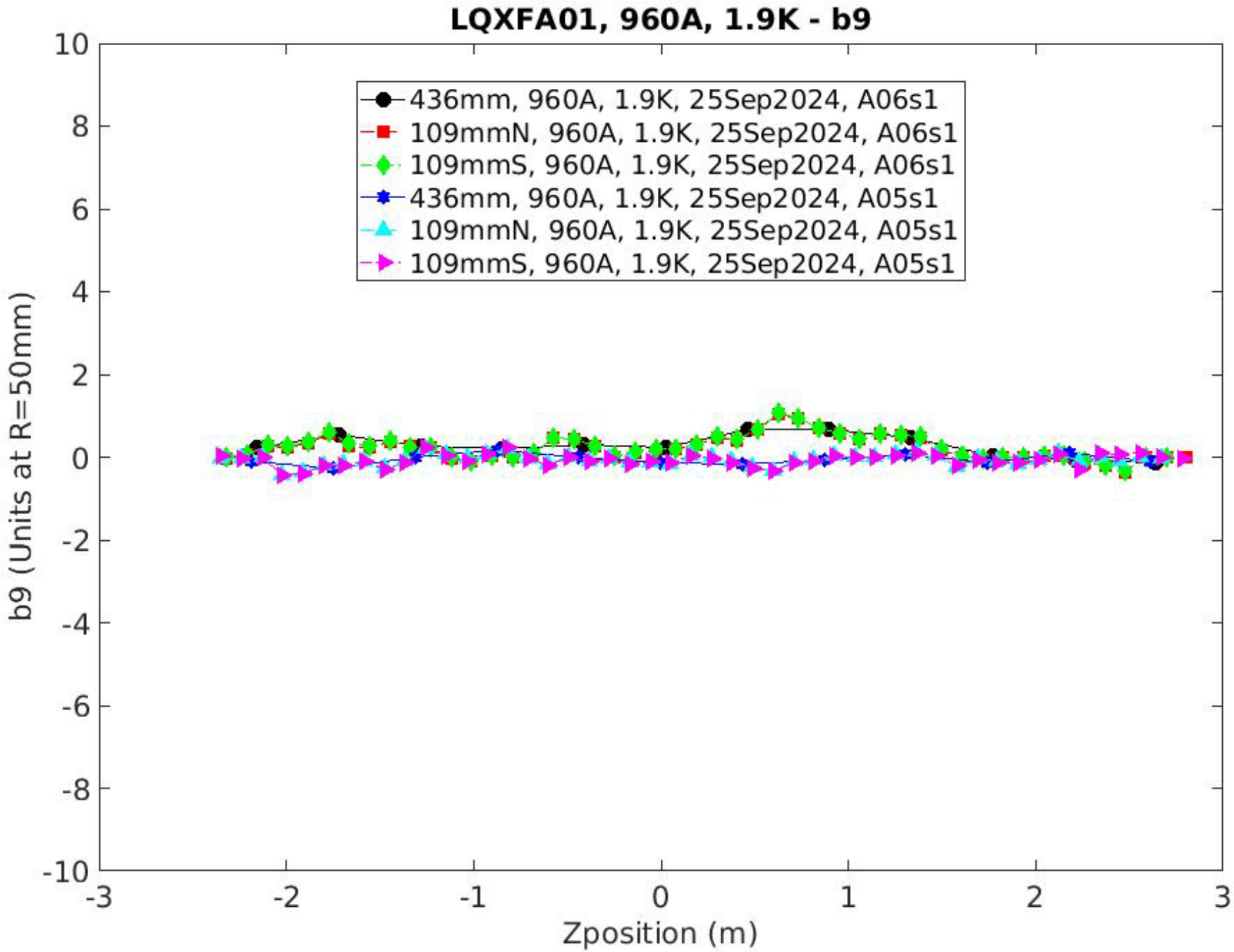

LQXFA01, 960A, 1.9K - b4
b4 (Units at R=50mm)
Zposition (m)
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1

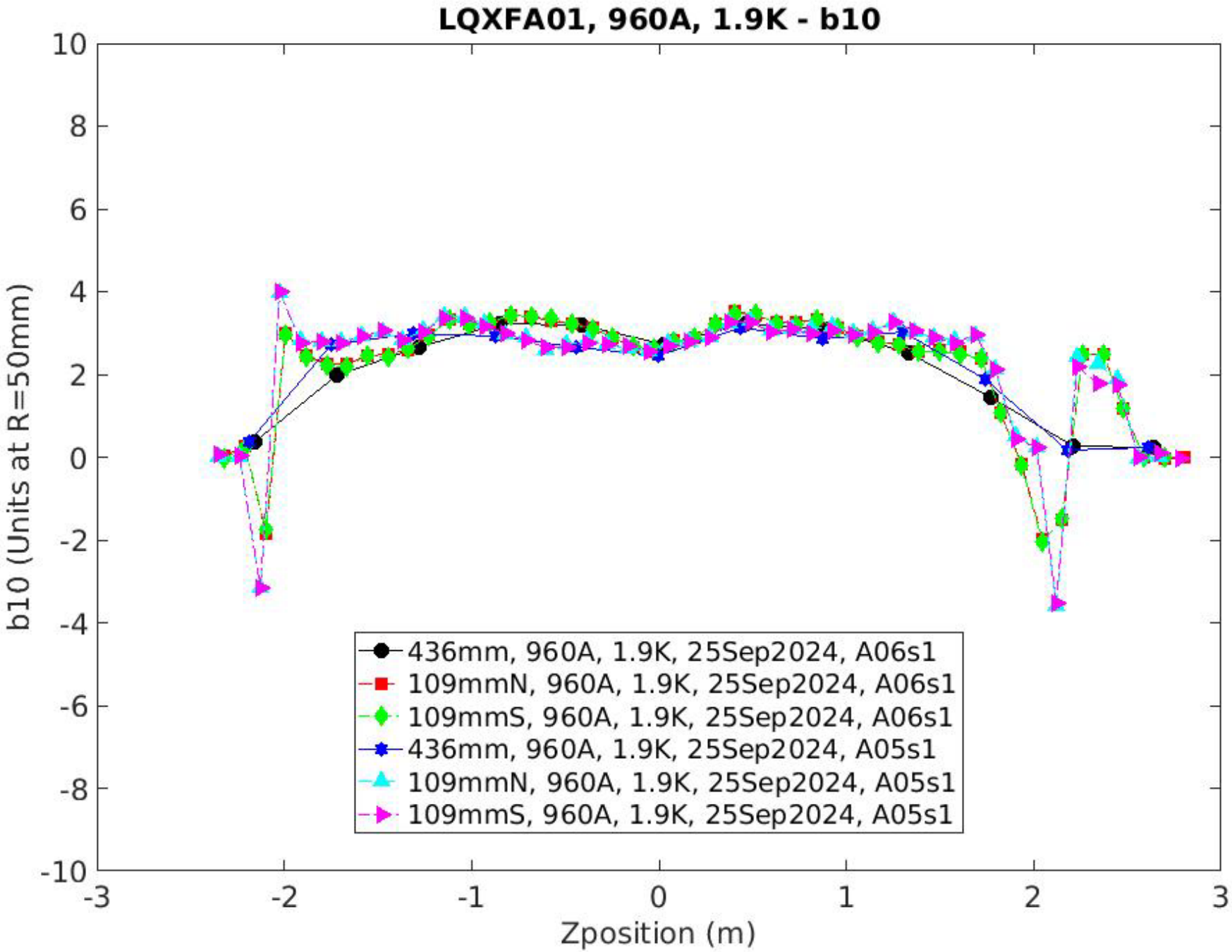

LQXFA01, 960A, 1.9K - b5
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
b5 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

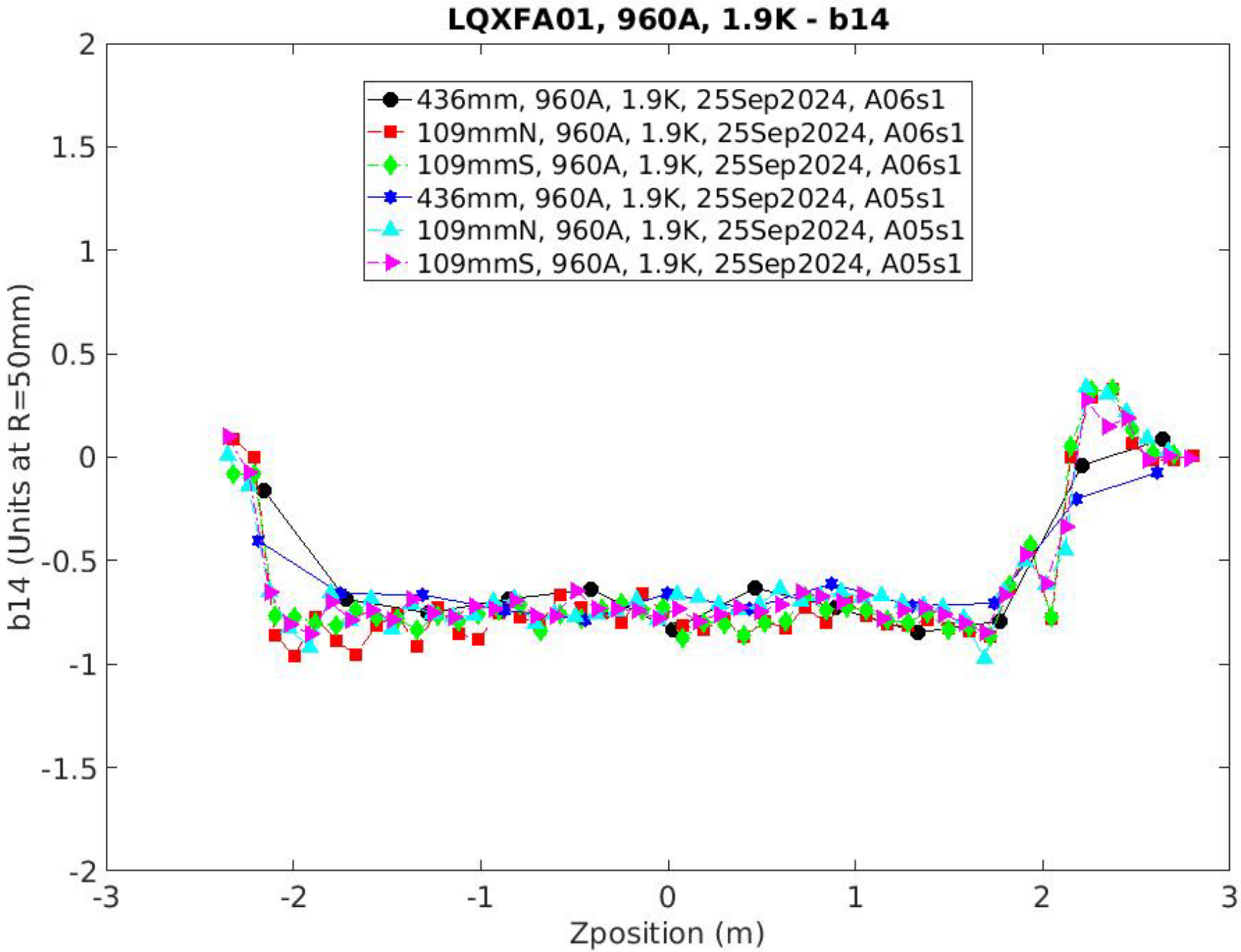

LQXFA01, 960A, 1.9K - b6
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
b6 (Units at R=50mm)
Zposition (m)
5
0
-5
-10
-15
-3
-2
-1
0
1
2
3


LQXFA01, 960A, 1.9K - b7
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
b7 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

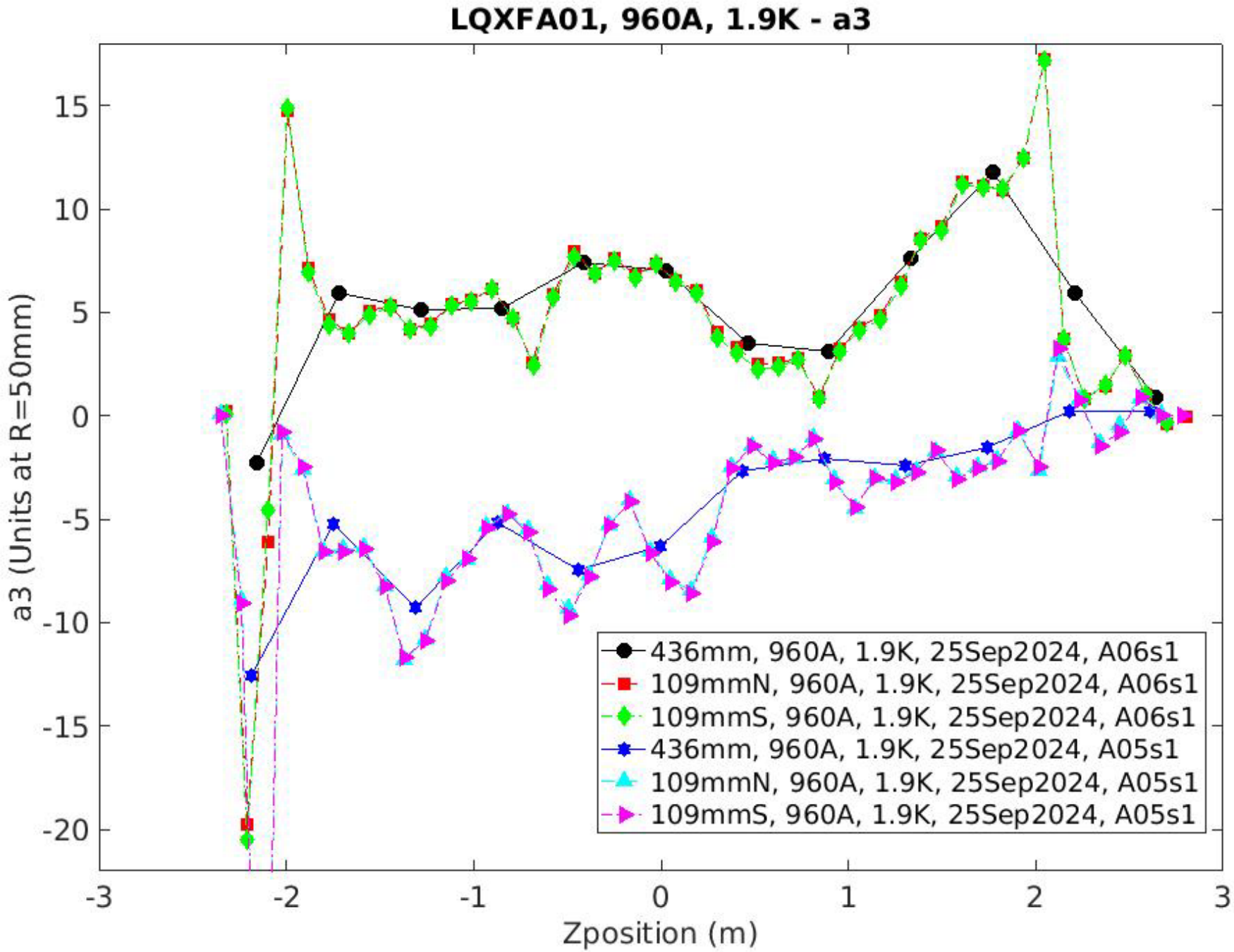

LQXFA01, 960A, 1.9K - b8
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
b8 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

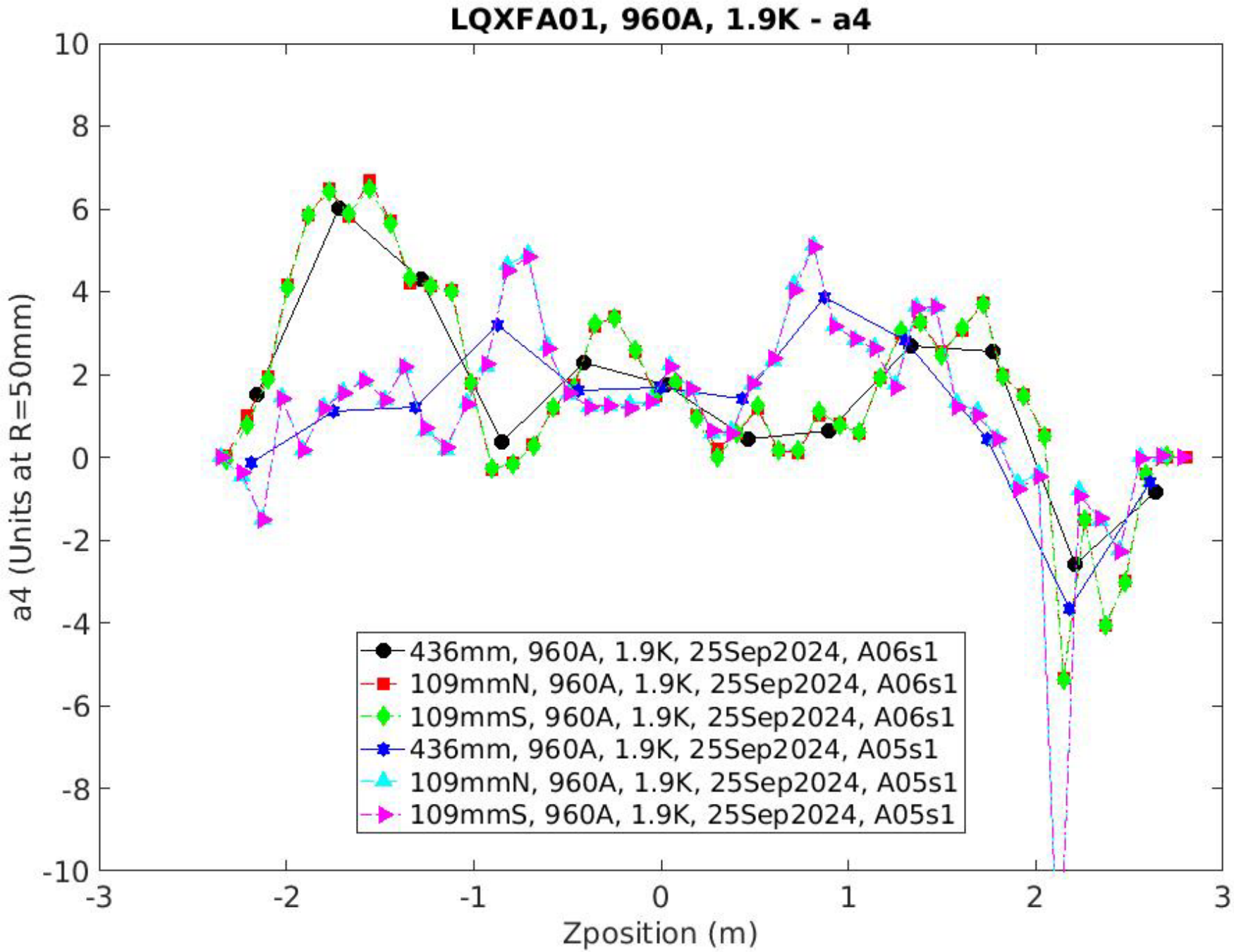

LQXFA01, 960A, 1.9K - b9
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
b9 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

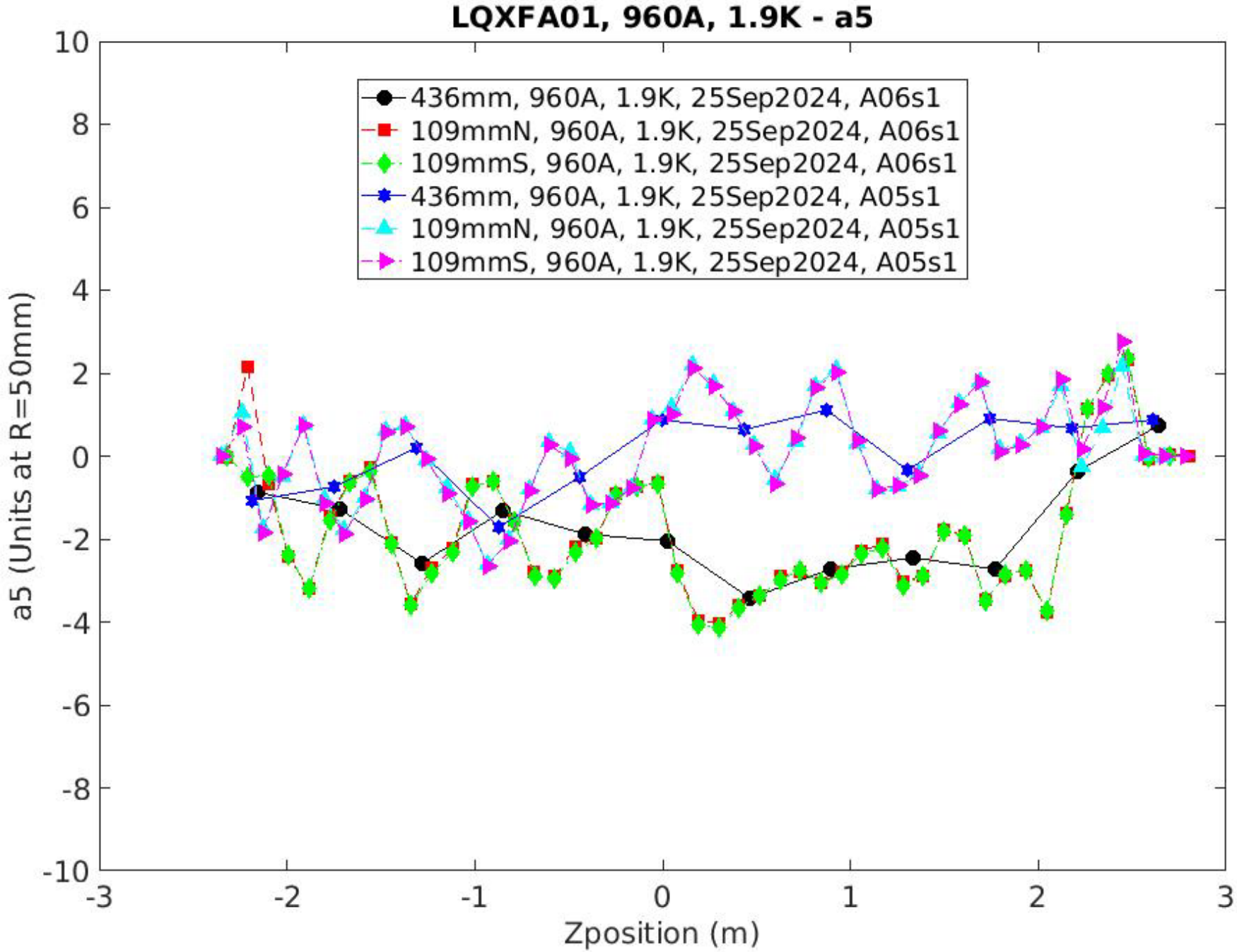

LQXFA01, 960A, 1.9K - b10
b10 (Units at R=50mm)
Zposition (m)
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1

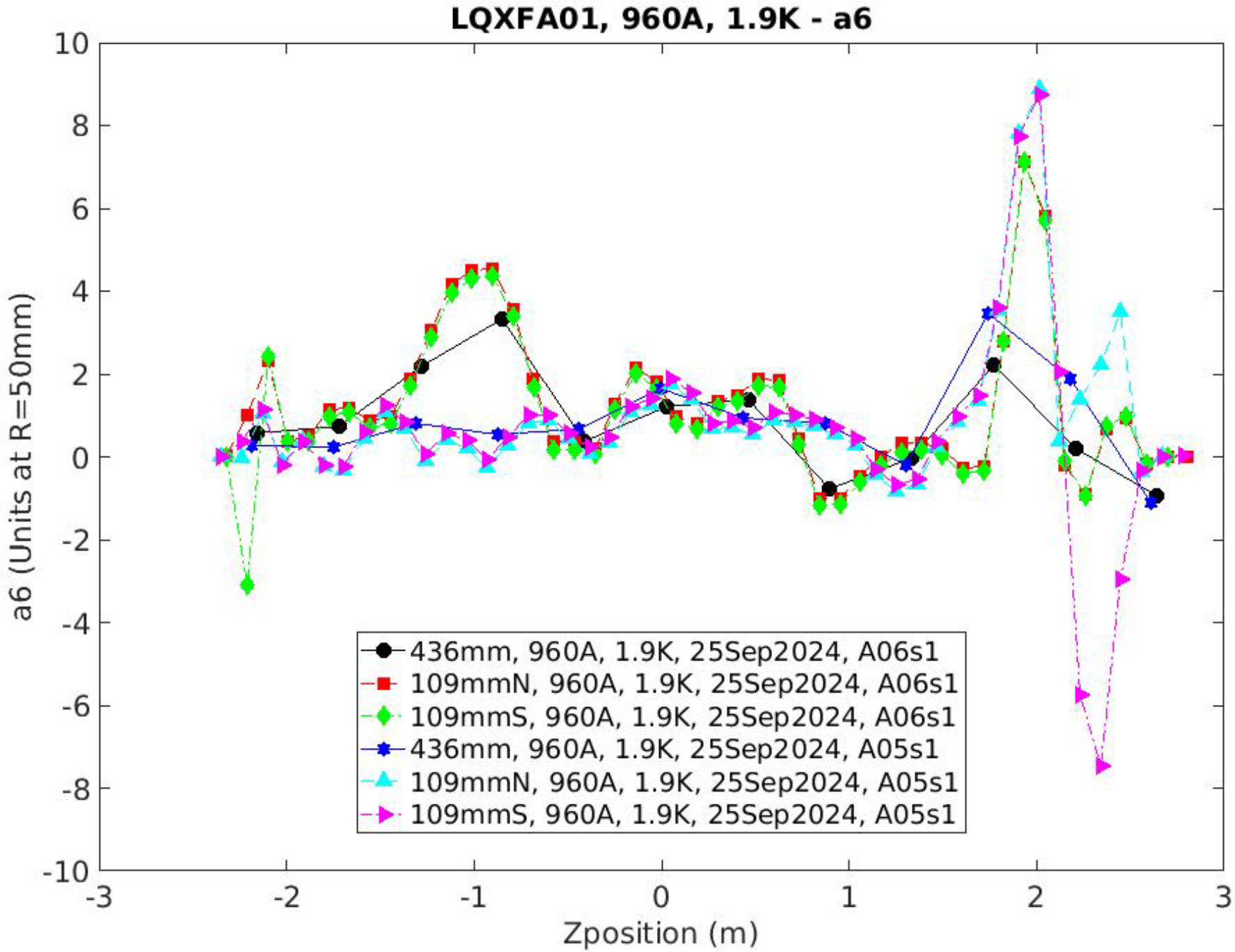

LQXFA01, 960A, 1.9K - b14
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
b14 (Units at R=50mm)
Zposition (m)
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-3
-2
-1
0
1
2
3

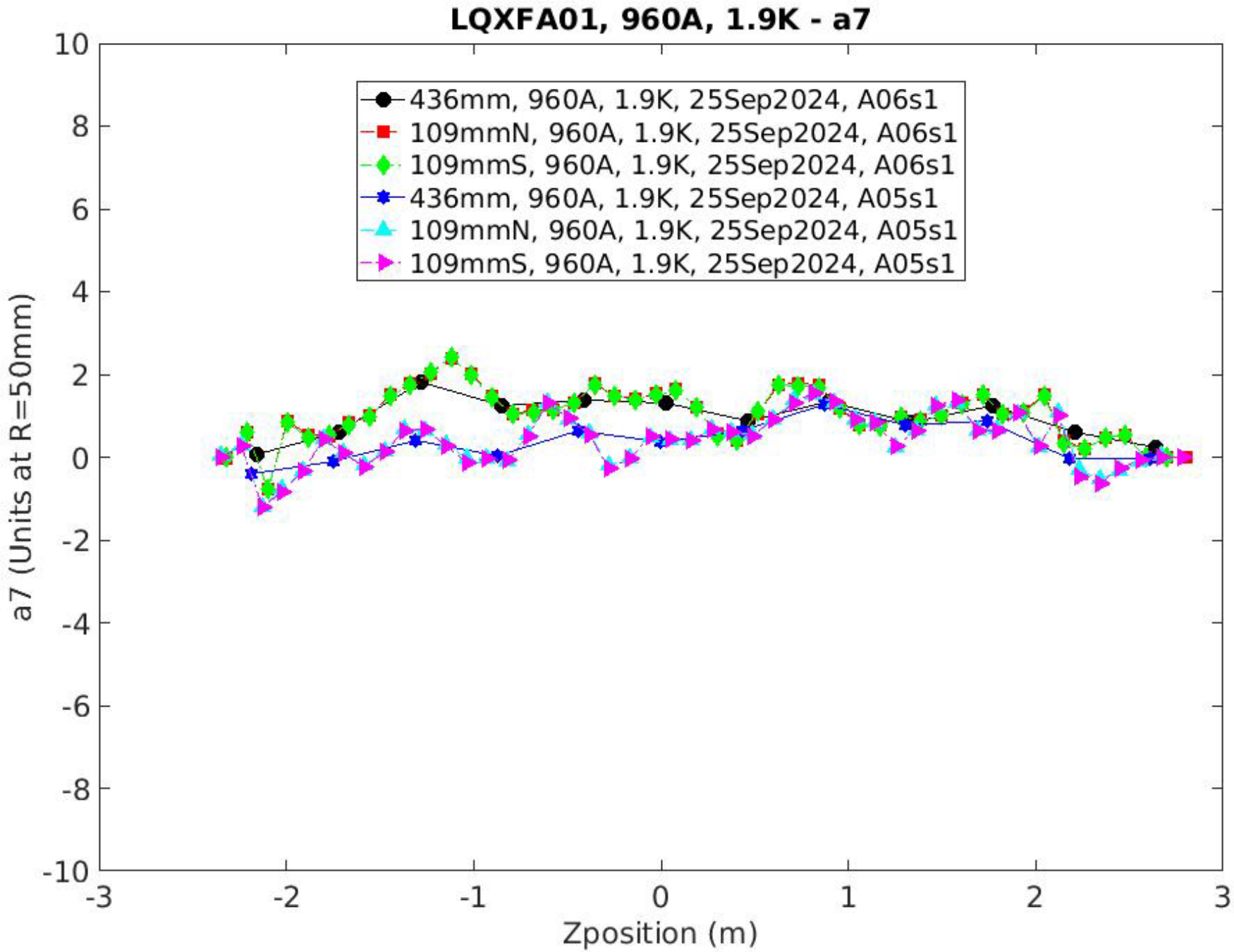
960A zscan Skew harmonics

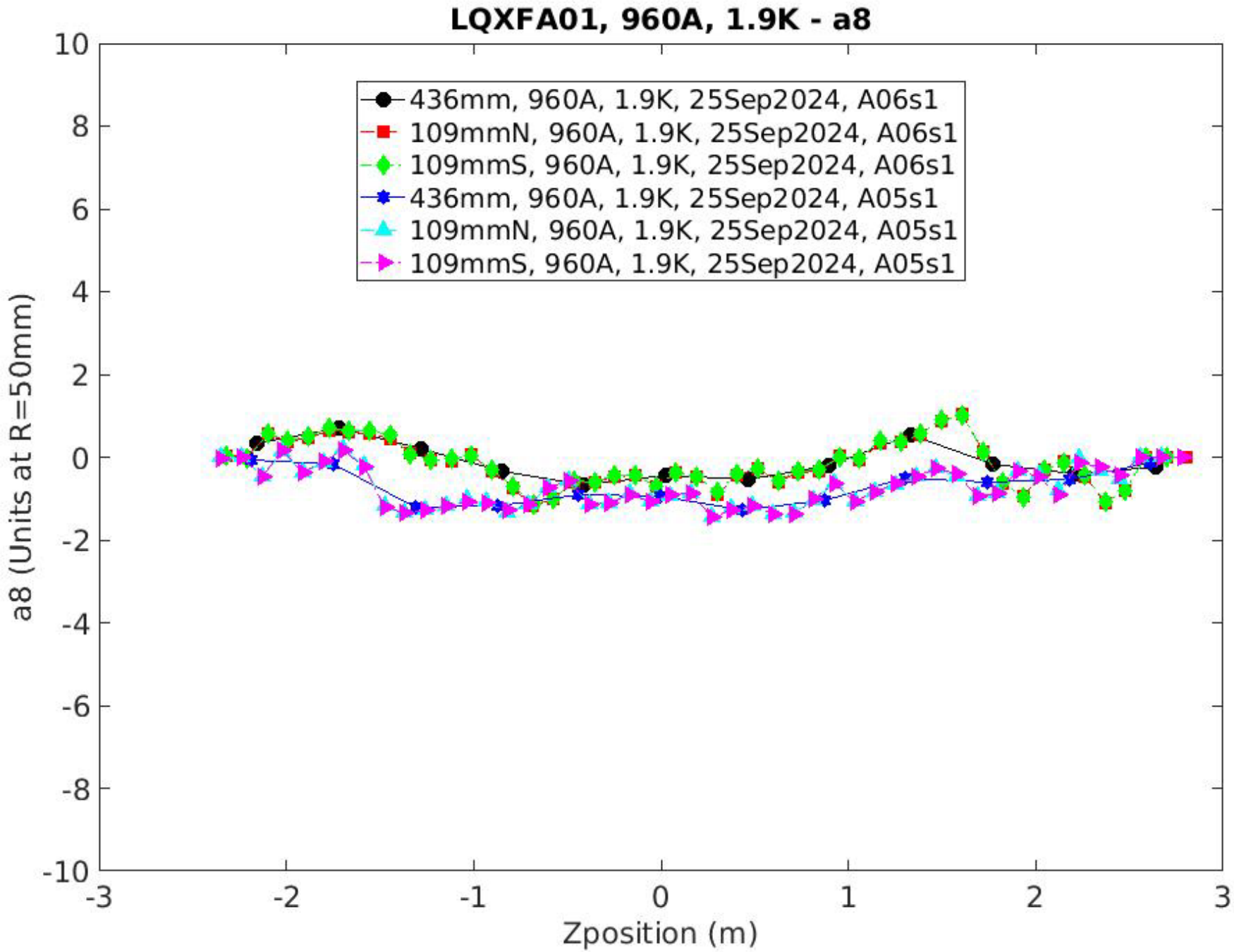

LQXFA01, 960A, 1.9K - a3
a3 (Units at R=50mm)
Zposition (m)
15
10
5
0
-5
-10
-15
-20
-3
-2
-1
0
1
2
3
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1

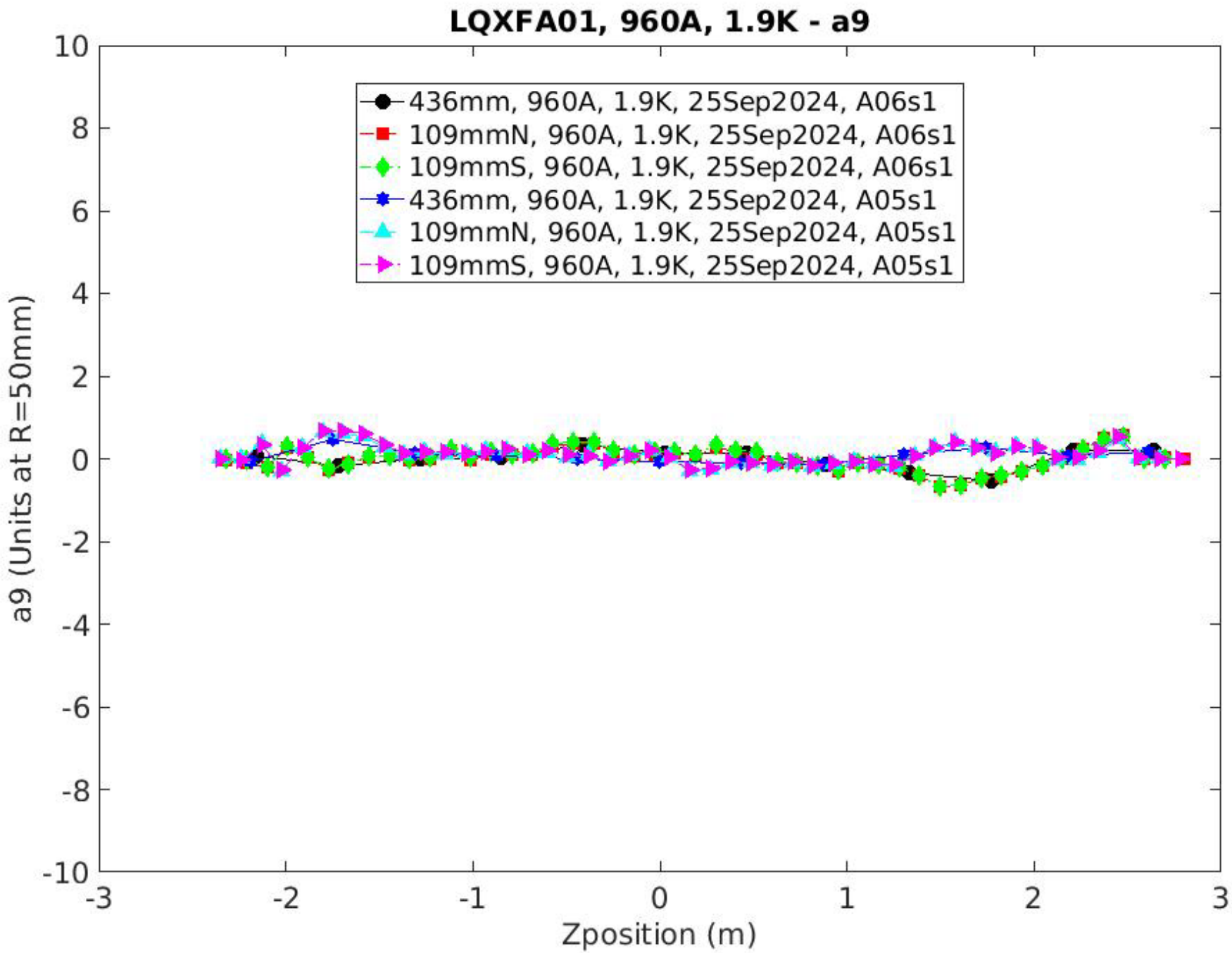

LQXFA01, 960A, 1.9K - a4
a4 (Units at R=50mm)
Zposition (m)
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1

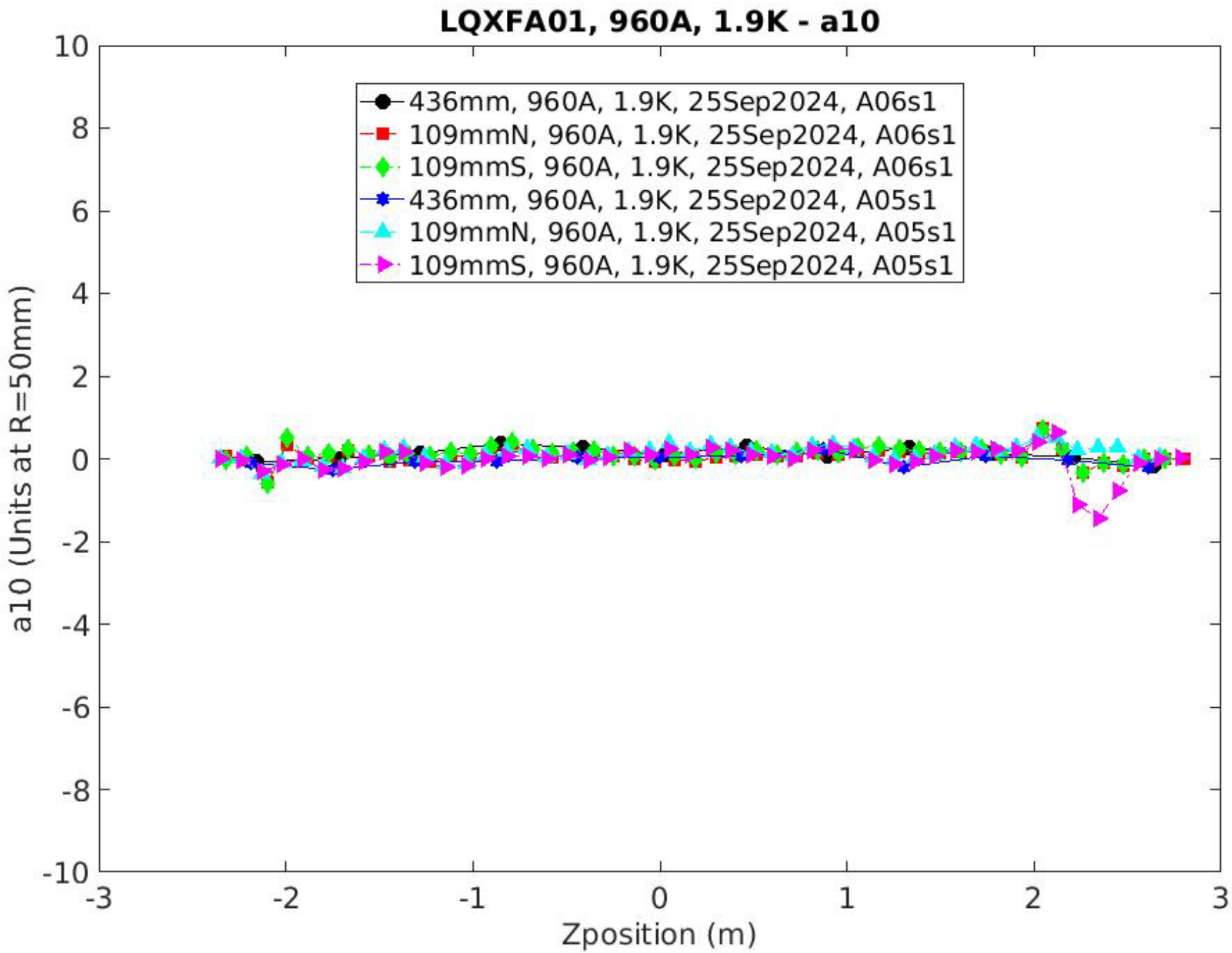

LQXFA01, 960A, 1.9K - a5
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
a5 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3


LQXFA01, 960A, 1.9K - a6
a6 (Units at R=50mm)
Zposition (m)
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1

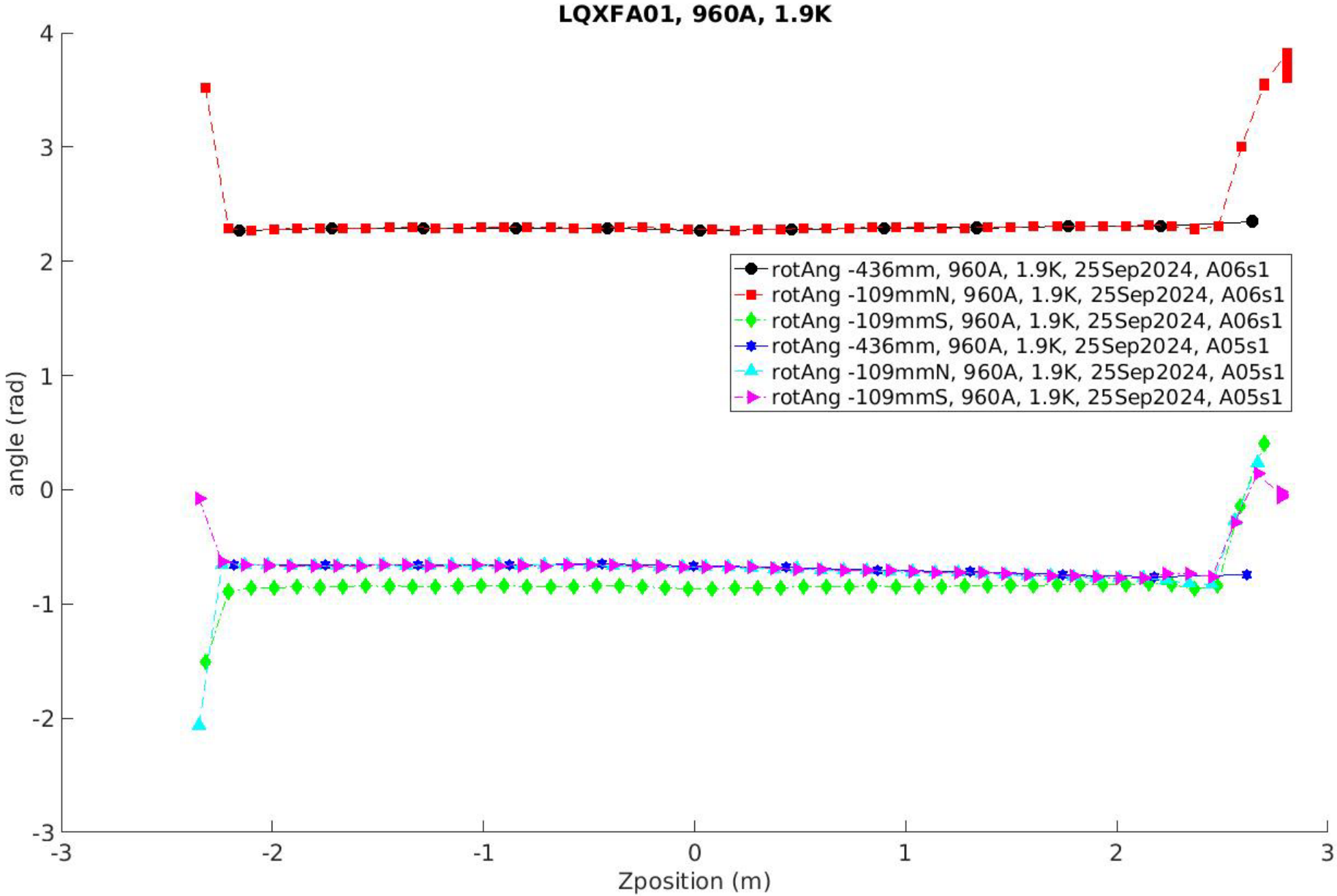

LQXFA01, 960A, 1.9K - a7
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
a7 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

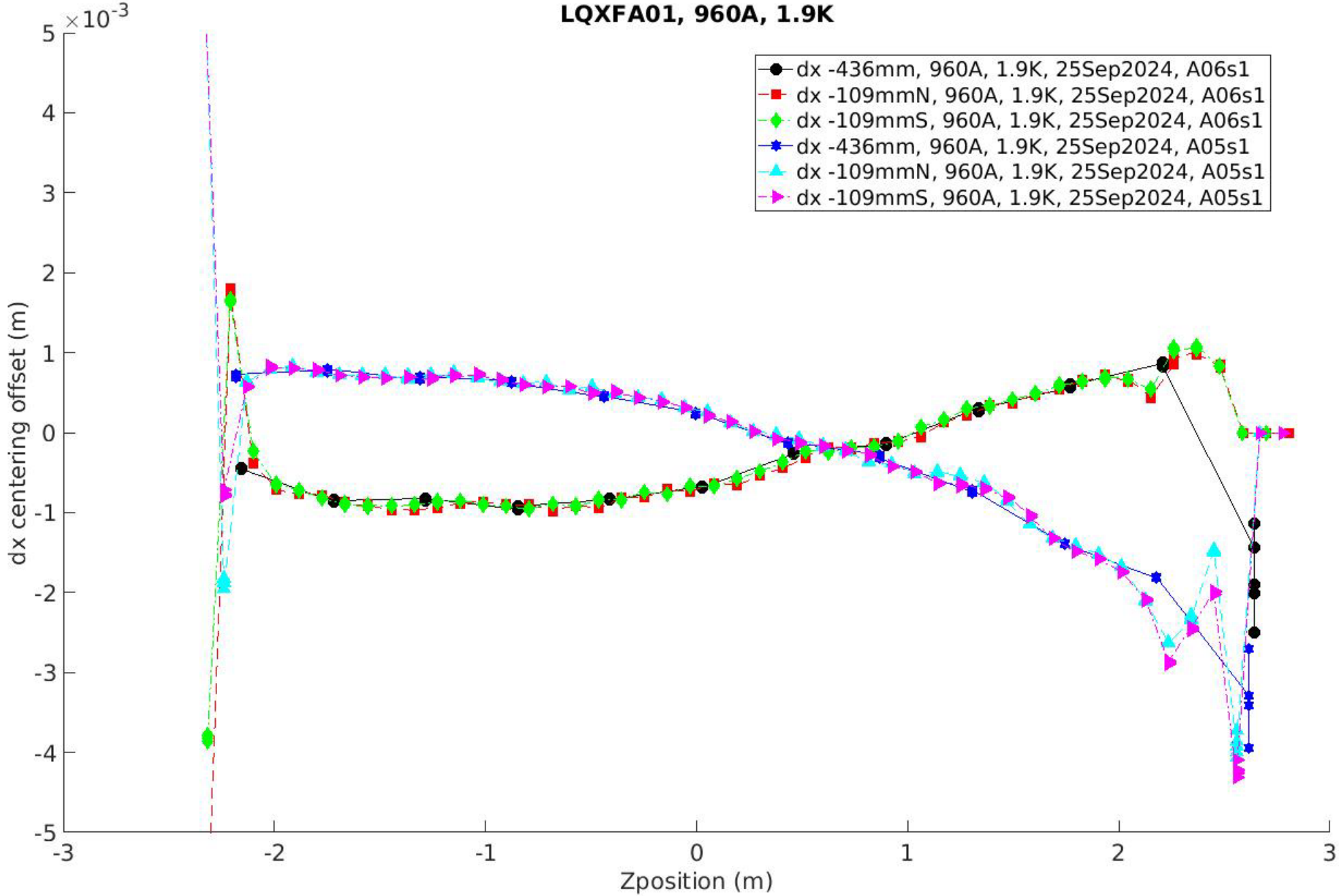

LQXFA01, 960A, 1.9K - a8
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
a8 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

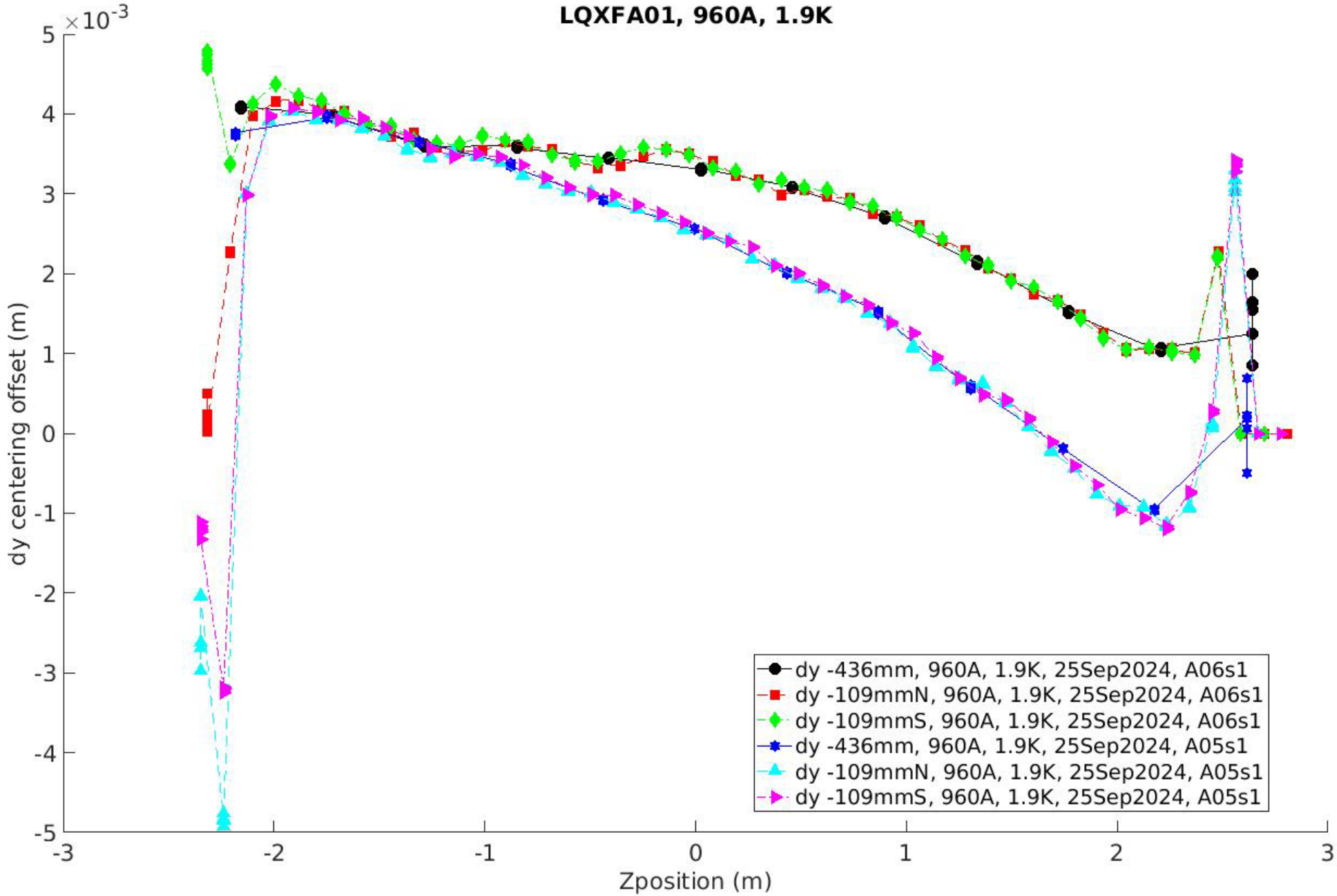

LQXFA01, 960A, 1.9K - a9
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
a9 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3


LQXFA01, 960A, 1.9K - a10
436mm, 960A, 1.9K, 25Sep2024, A06s1
109mmN, 960A, 1.9K, 25Sep2024, A06s1
109mmS, 960A, 1.9K, 25Sep2024, A06s1
436mm, 960A, 1.9K, 25Sep2024, A05s1
109mmN, 960A, 1.9K, 25Sep2024, A05s1
109mmS, 960A, 1.9K, 25Sep2024, A05s1
a10 (Units at R=50mm)
Zposition (m)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-3
-2
-1
0
1
2
3

Other


LQXFA01, 960A, 1.9K
angle (rad)
Zposition (m)
4
3
2
1
0
-1
-2
-3
-3
-2
-1
0
1
2
3
rotAng -436mm, 960A, 1.9K, 25Sep2024, A06s1
rotAng -109mmN, 960A, 1.9K, 25Sep2024, A06s1
rotAng -109mmS, 960A, 1.9K, 25Sep2024, A06s1
rotAng -436mm, 960A, 1.9K, 25Sep2024, A05s1
rotAng -109mmN, 960A, 1.9K, 25Sep2024, A05s1
rotAng -109mmS, 960A, 1.9K, 25Sep2024, A05s1


LQXFA01, 960A, 1.9K
×10^-3
dx centering offset (m)
Zposition (m)
dx -436mm, 960A, 1.9K, 25Sep2024, A06s1
dx -109mmN, 960A, 1.9K, 25Sep2024, A06s1
dx -109mmS, 960A, 1.9K, 25Sep2024, A06s1
dx -436mm, 960A, 1.9K, 25Sep2024, A05s1
dx -109mmN, 960A, 1.9K, 25Sep2024, A05s1
dx -109mmS, 960A, 1.9K, 25Sep2024, A05s1
5
4
3
2
1
0
-1
-2
-3
-4
-5
-3
-2
-1
0
1
2
3


LQXFA01, 960A, 1.9K
×10^-3
dy centering offset (m)
Zposition (m)
dy -436mm, 960A, 1.9K, 25Sep2024, A06s1
dy -109mmN, 960A, 1.9K, 25Sep2024, A06s1
dy -109mmS, 960A, 1.9K, 25Sep2024, A06s1
dy -436mm, 960A, 1.9K, 25Sep2024, A05s1
dy -109mmN, 960A, 1.9K, 25Sep2024, A05s1
dy -109mmS, 960A, 1.9K, 25Sep2024, A05s1