

MQXFA07 Quench Antenna Results

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04Nov2021

Summary of quenches (from Joe Muratore/Anis Ben Yahia):

1.	$I_Q = 15361 \text{ A}$	Coil 114 Inner Pole Turn T-SS	26.0 MIlts	1.9 K
2.	$I_Q = 15902 \text{ A}$	Coil 214 Inner Pole Turn NT-SS + LE + NLE	25.7 MIlts	1.9 K
3.	$I_Q = 16101 \text{ A}$	Coil 212 Inner Pole Turn T-SS	25.5 MIlts	1.9 K
4.	$I_Q = 16094 \text{ A}$	Coil 214 Inner multiturn	26.7 MIlts	1.9 K
5.	$I_Q = 15288 \text{ A}$	Coil 214 Inner multiturn	26.4 MIlts	1.9 K
6.	$I_Q = 15268 \text{ A}$	Coil 214 Inner multiturn	26.3 MIlts	1.9 K
7.	$I_Q = 15084 \text{ A}$	Coil 214 Inner multiturn	26.5 MIlts	1.9 K
8.	$I_Q = 14989 \text{ A}$	Coil 214 Inner multiturn	26.3 MIlts	1.9 K
9.	$I_Q = 15091 \text{ A}$	Coil 214 Inner multiturn	26.4 MIlts	1.9 K
10.	$I_Q = 15832 \text{ A}$	Coil 214 Inner multiturn + Inner Pole Turn NT-SS + LE + NLE	24.3 MIlts	4.5 K
11.	$I_Q = 16509 \text{ A}$	Coil 114 Inner Pole Turn NT-SS + LE + NLE	25.0 MIlts	1.9 K, 100 A/s, 5 A/s ²
12.	$I_Q = 16355 \text{ A}$	Coil 214 Inner multiturn	25.7 MIlts	1.9 K, 60 A/s, 5 A/s ²
13.	$I_Q = 15023 \text{ A}$	Coil 214 Inner multiturn	25.9 MIlts	1.9 K
14.	$I_Q = 15736 \text{ A}$	Coil 214 (A4-A7) Inner Pole Turn NT-SS + LE + NLE	24.1 MIlts	4.5 K



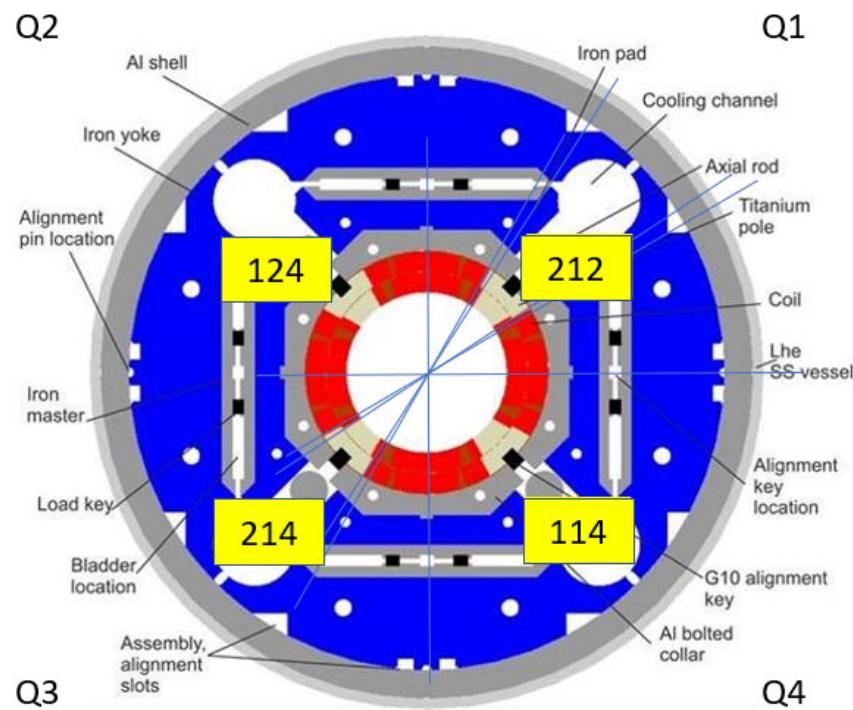
Full length Z-coverage
with 111, 50mm-long
flex circuits.

Overlapping, dipole and
quadrupole bucked (DQBuck)
circuits, staggered so there are
no 'dead zones' in Z

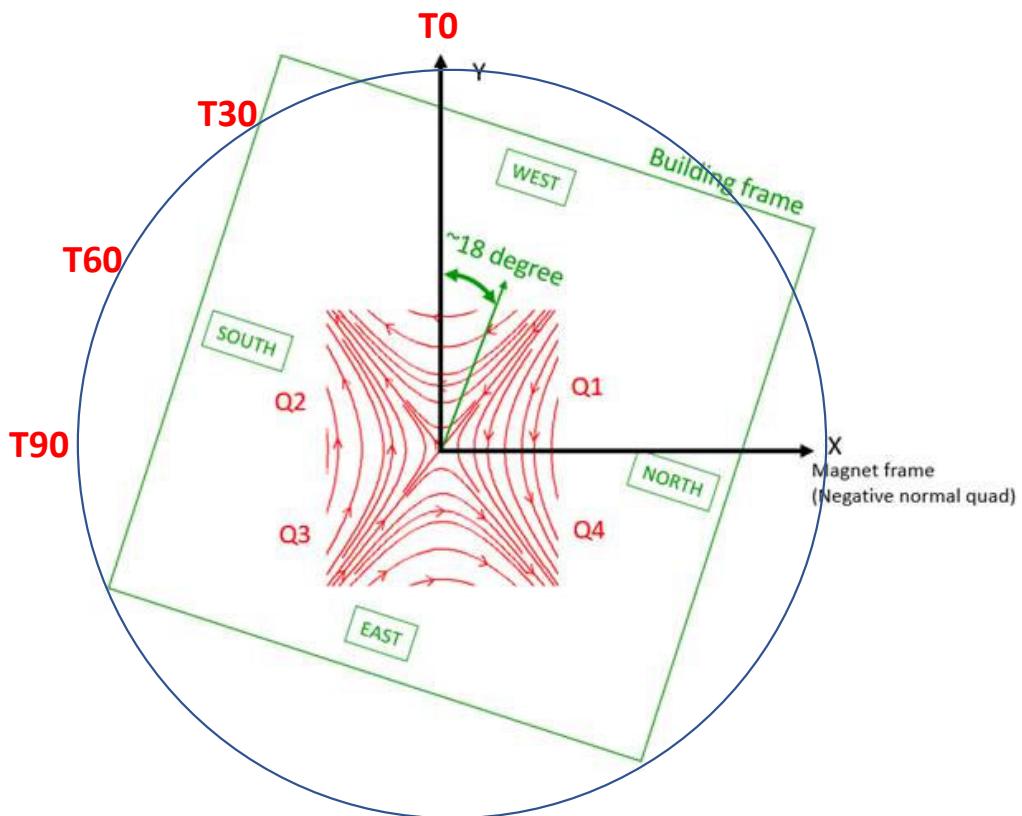
Theta detection with
12, full-length DQBuck
radial circuits
Positioned every 30 degrees.

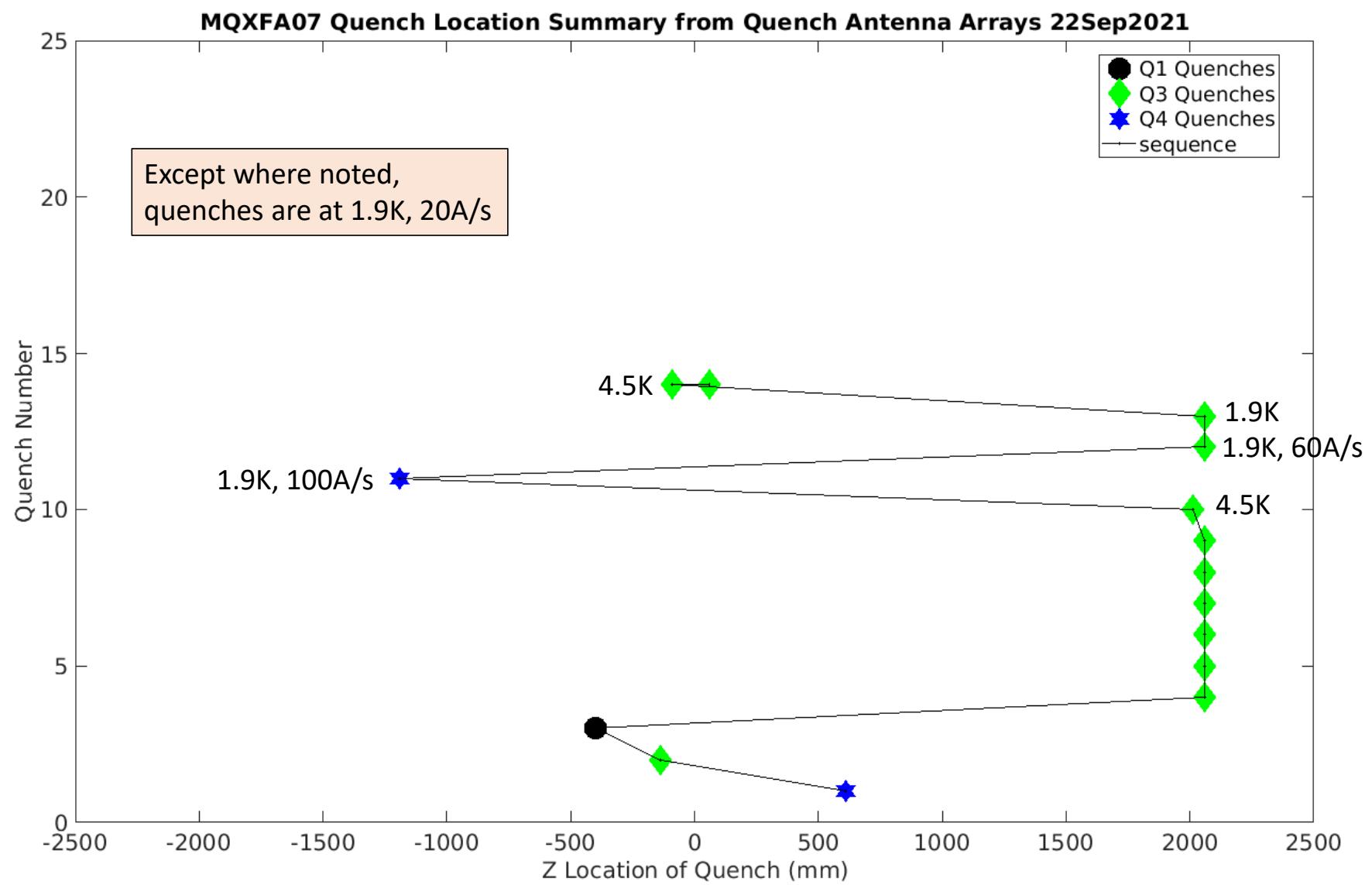


Theta Antennas



Quench Antenna T0 placed along Y-axis

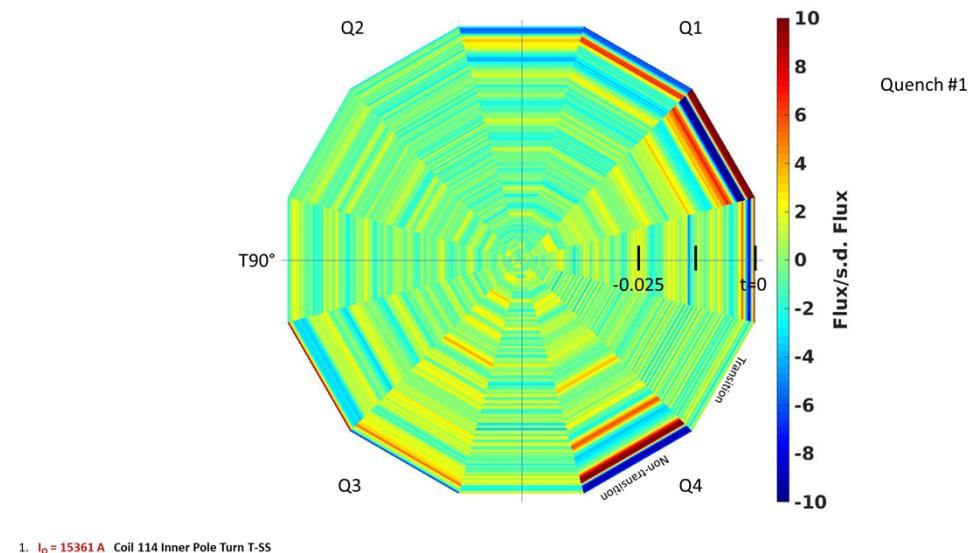
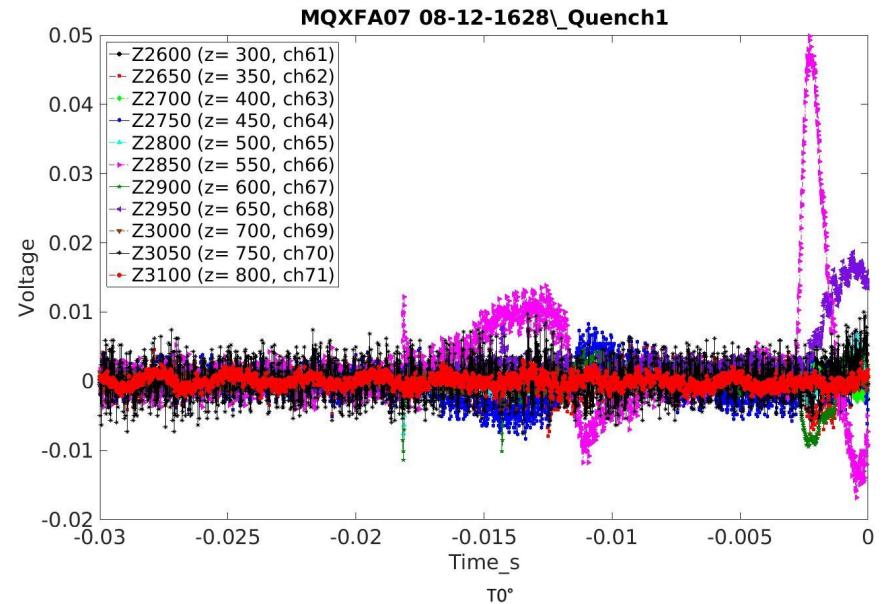
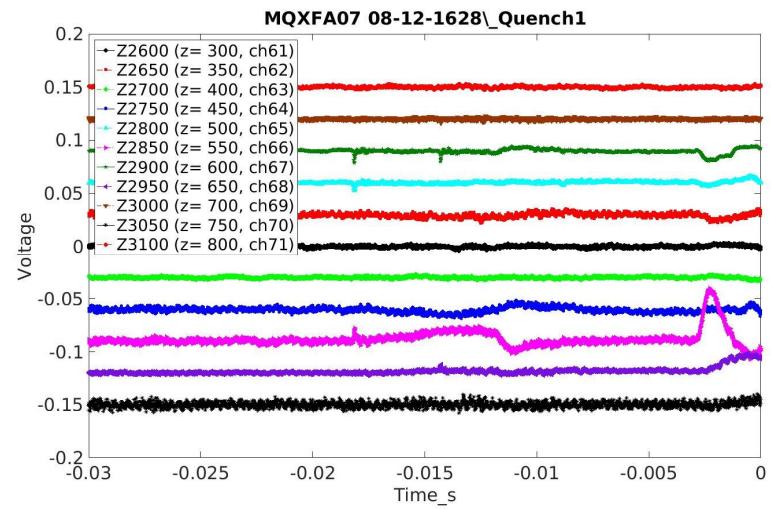
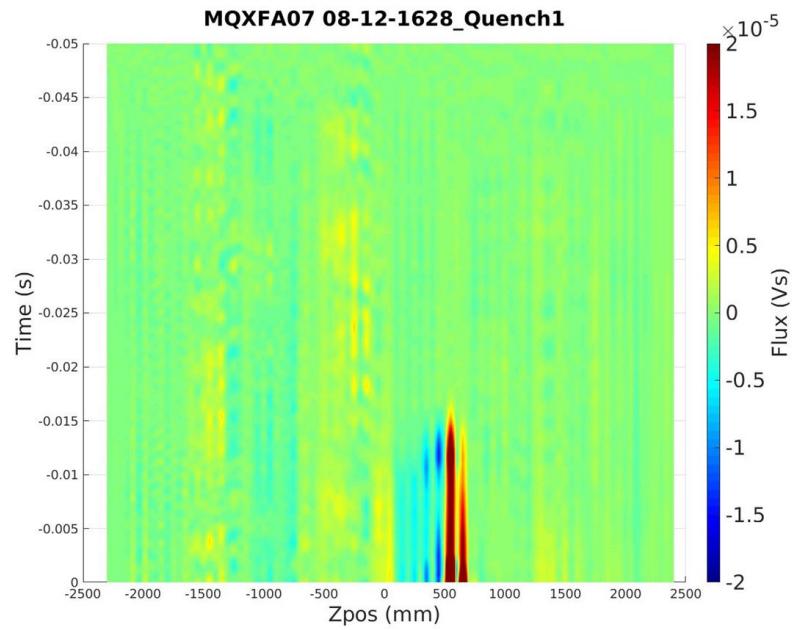




MQXFA07 QAnt Quench Location Summary
millimeters wrt z=0 magnet center

Quench Number	Quench Z-Location Signal	Quadrant
1	600	Q4
2	-150	Q3
3	-400	Q1
4	2050	Q3
5	2050	Q3
6	2050	Q3
7	2050	Q3
8	2050	Q3
9	2050	Q3
10	2000	Q3
11	-1200	Q4
12	2050	Q3
13	2050	Q3
14	-100, 50	Q3

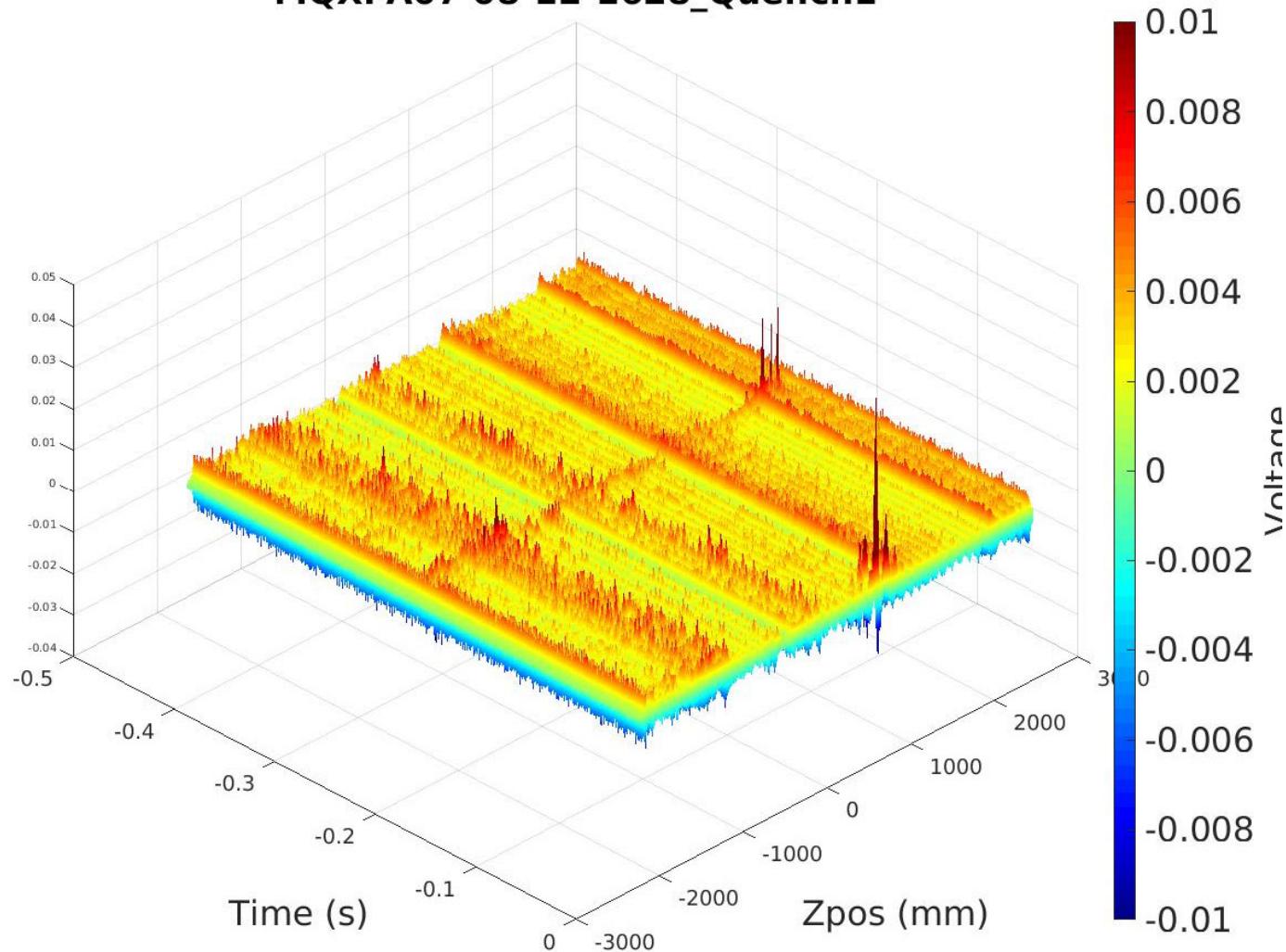
Q#1

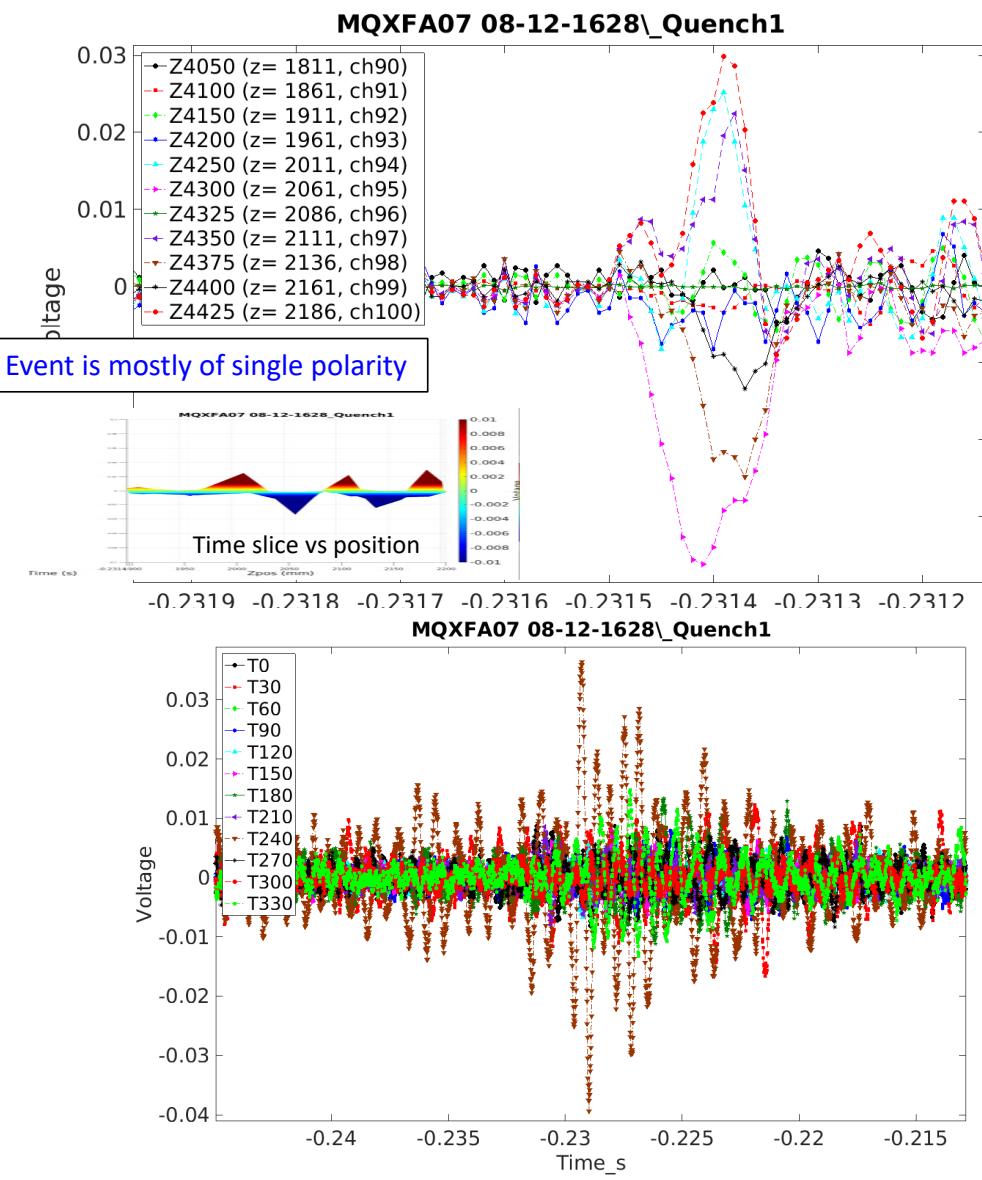


MQXFA07 08-12-1628_Quench1

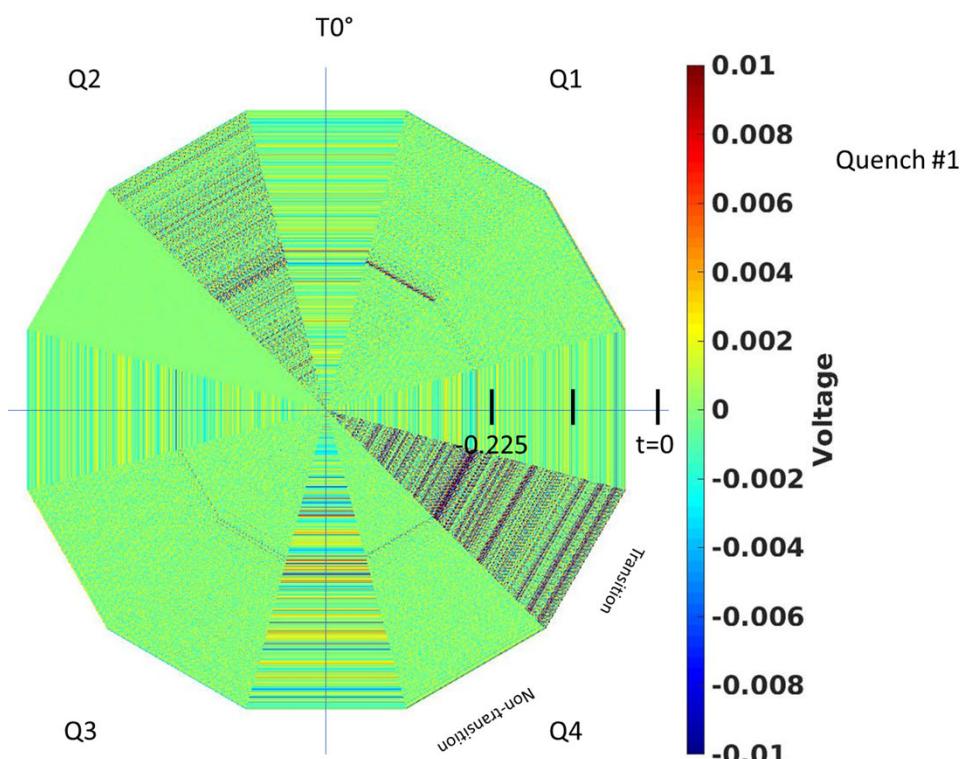
Flux change event at -231ms
that traveled length of
magnet in about 4 ms
(~1000m/s)

Location is near z-location
where limiting quenches
would later be.

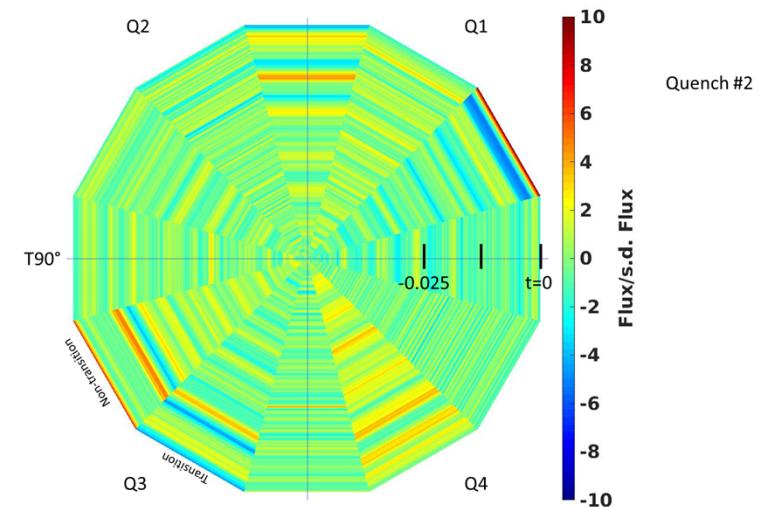
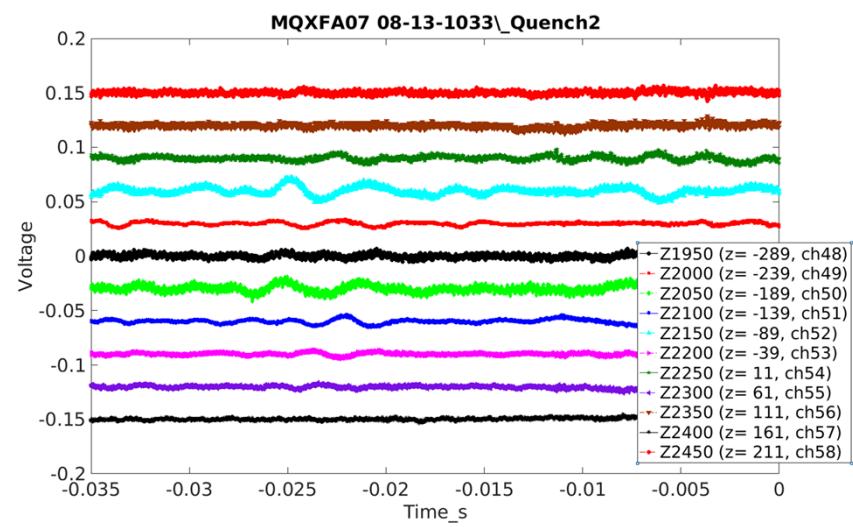
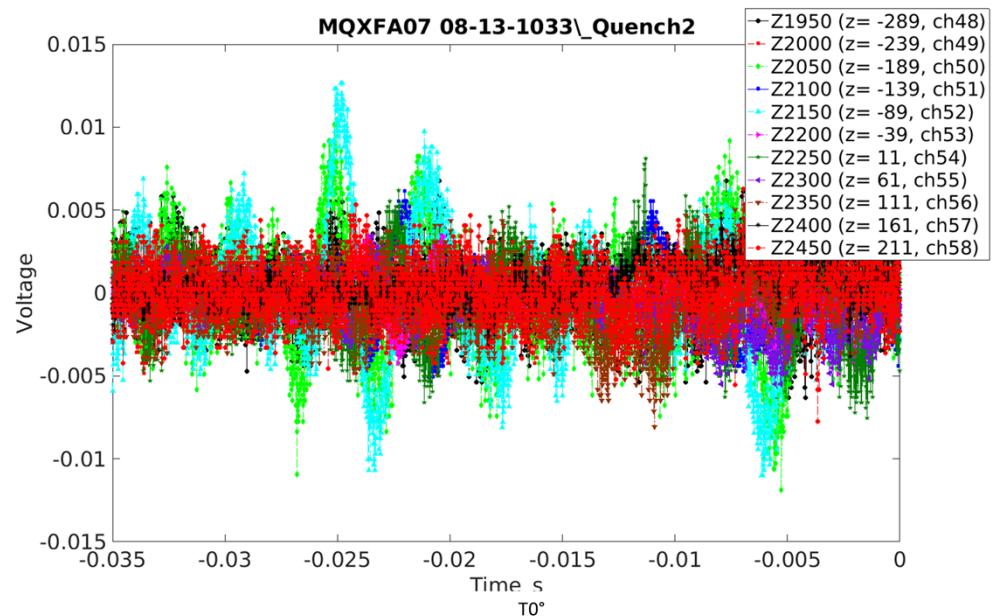
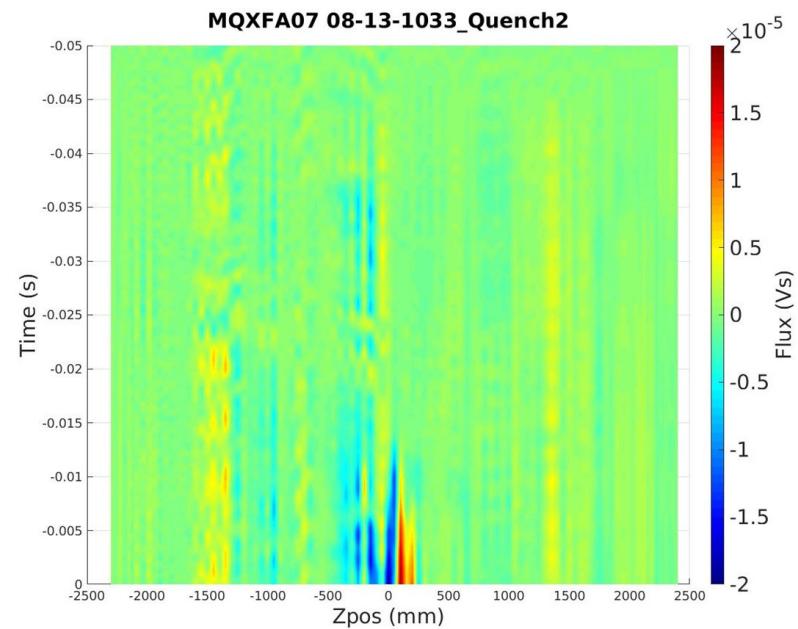




-231ms event was seen azimuthally predominantly in Q4 (limiting quenches occur in Q3) – so this event may not be of particular significance.

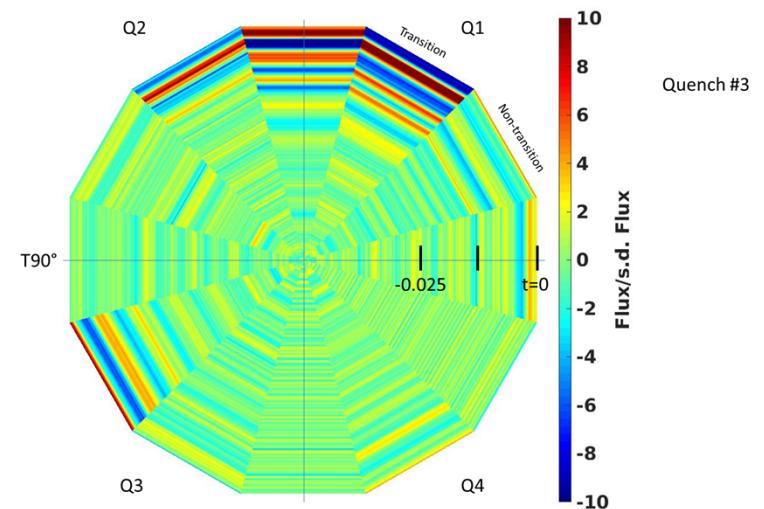
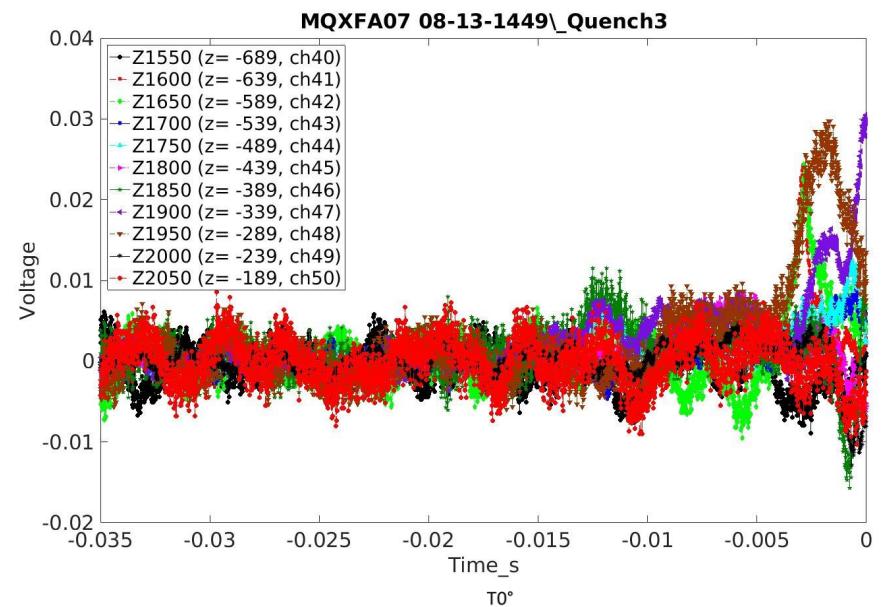
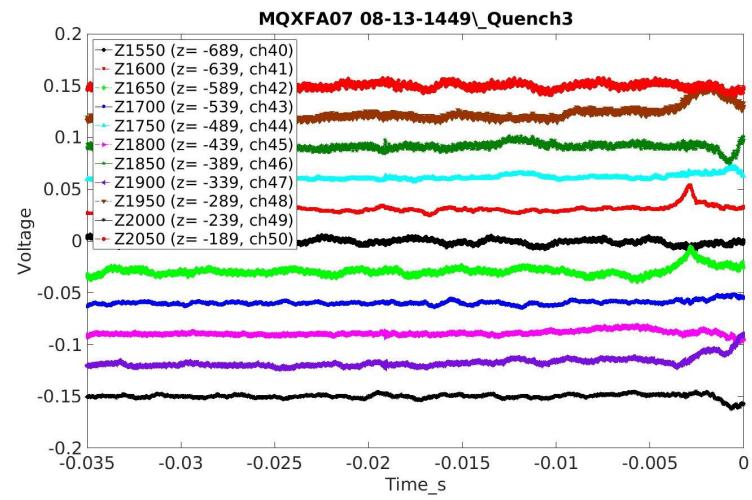
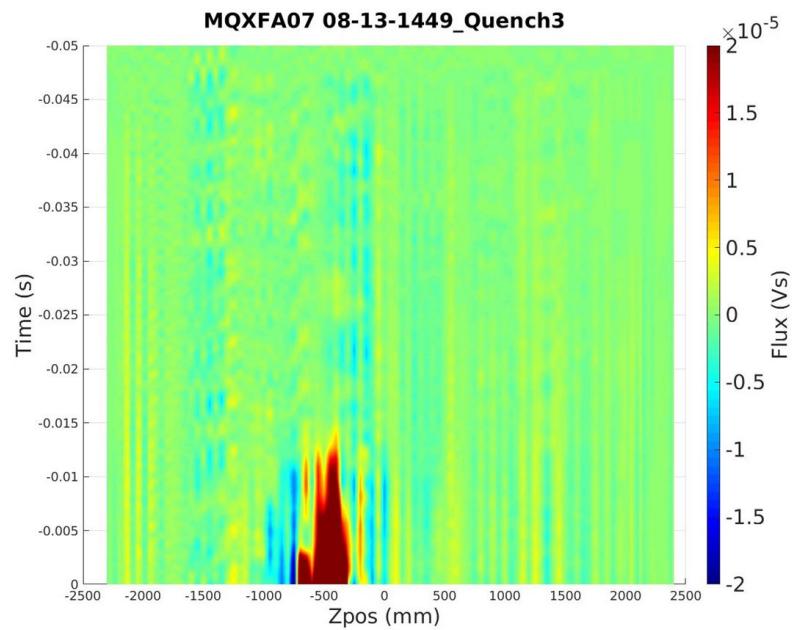


Q#2



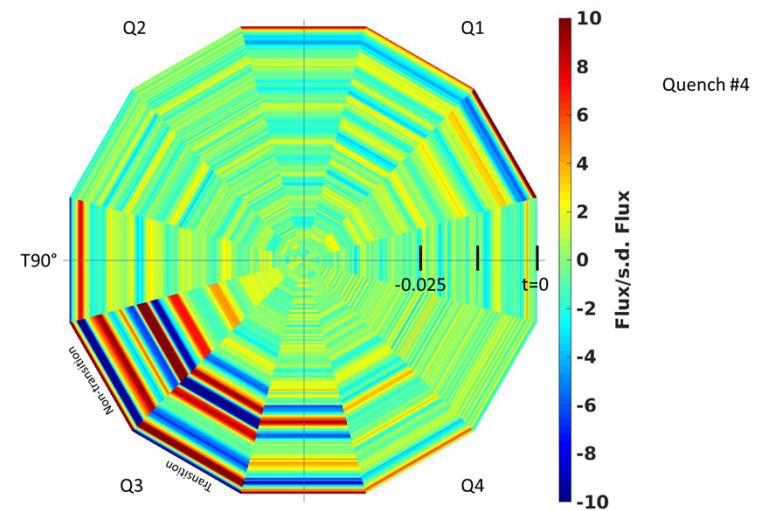
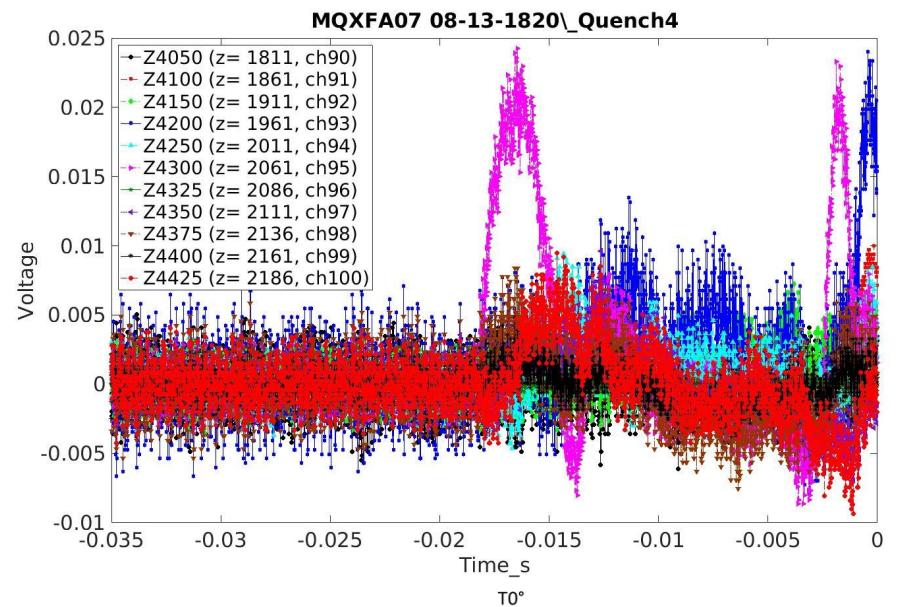
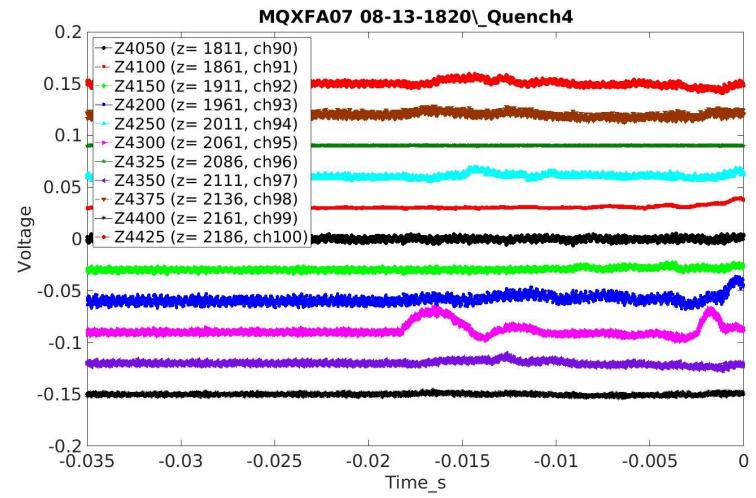
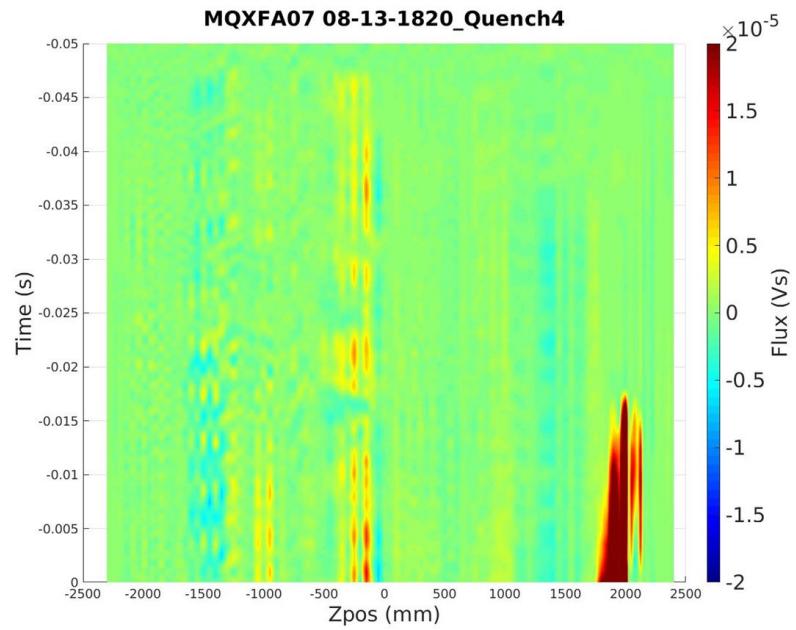
2. $I_q = 15902$ A Coil 214 Inner Pole Turn NT-SS + LE + NLE

Q#3



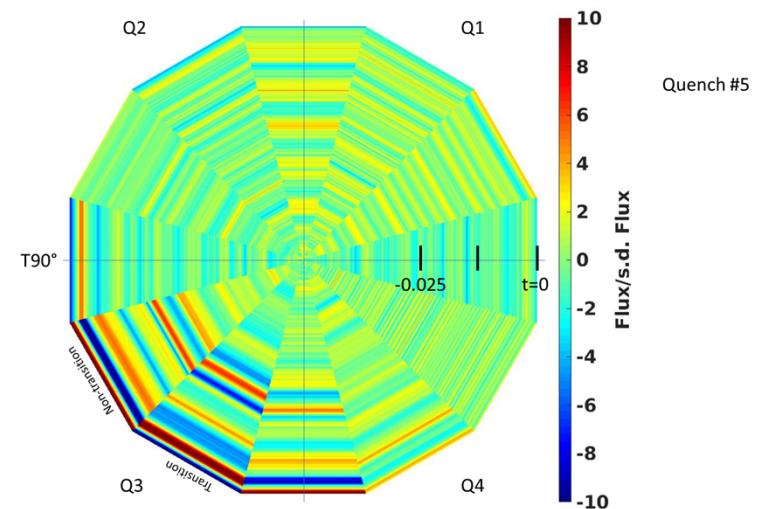
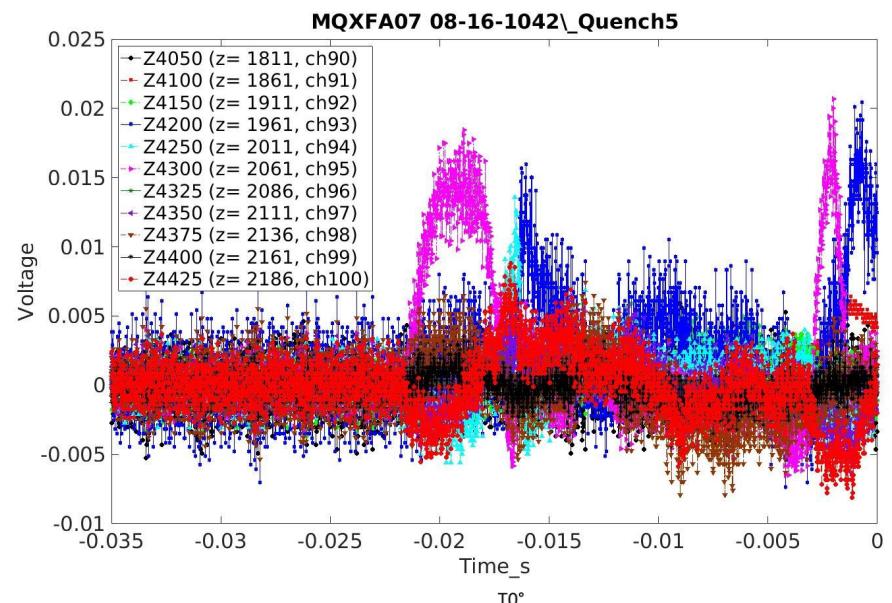
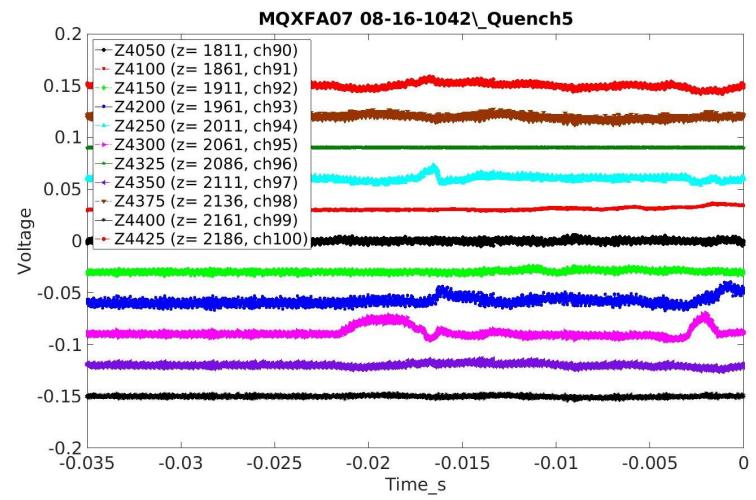
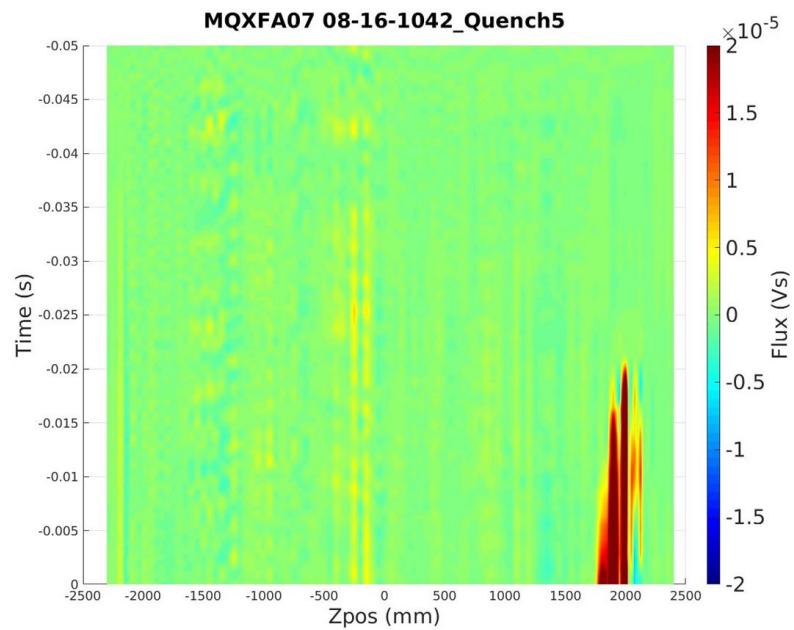
3. $I_q = 16101 \text{ A}$ Coil 212 Inner Pole Turn T-55

Q#4



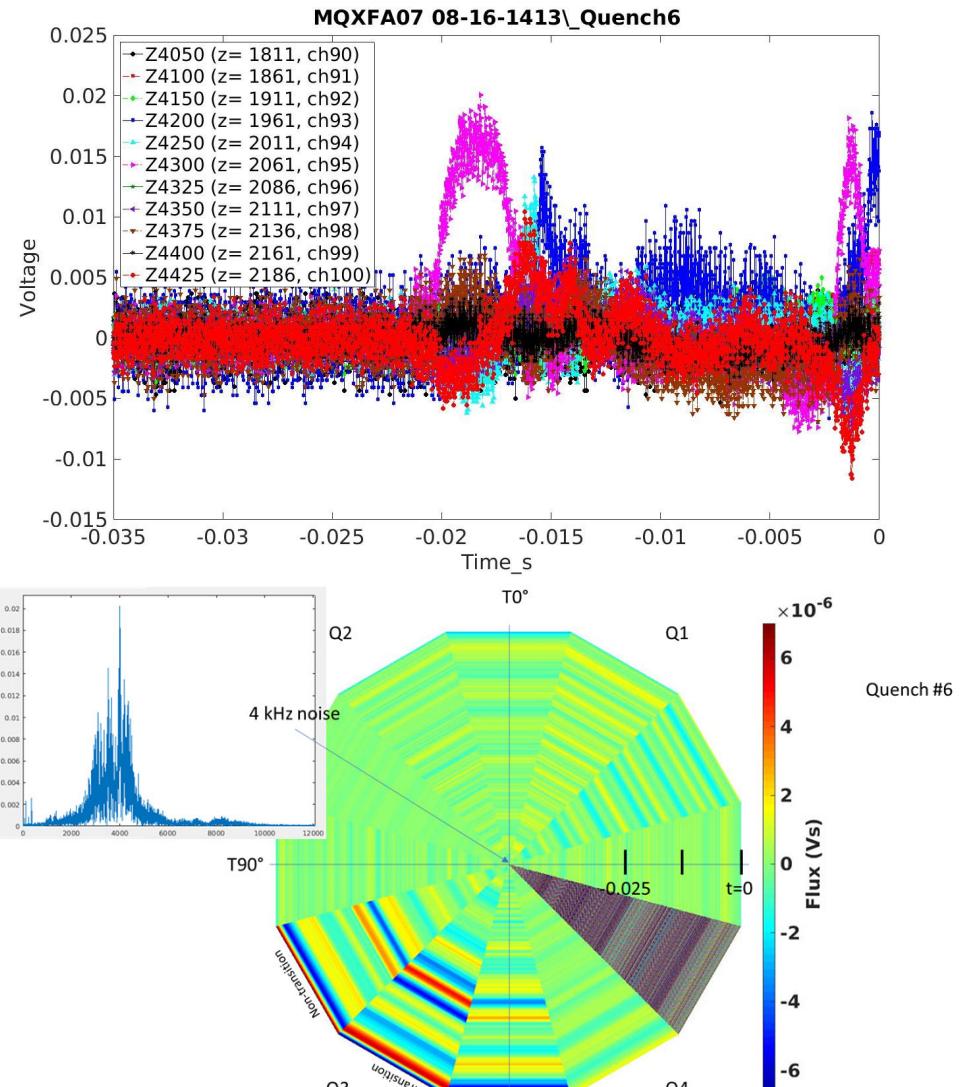
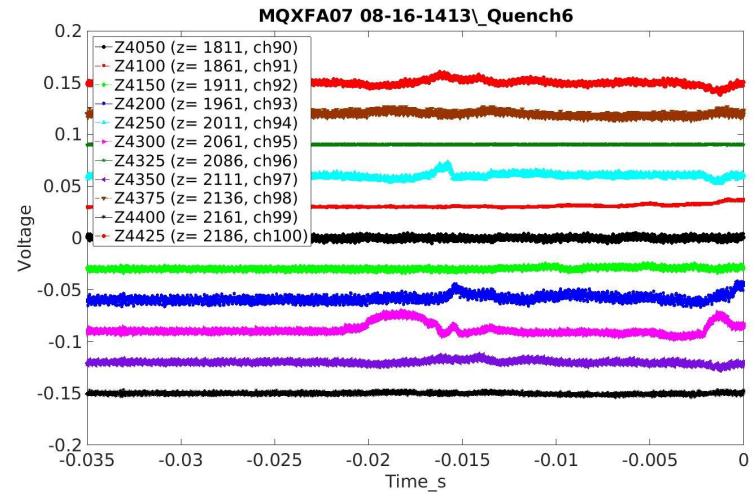
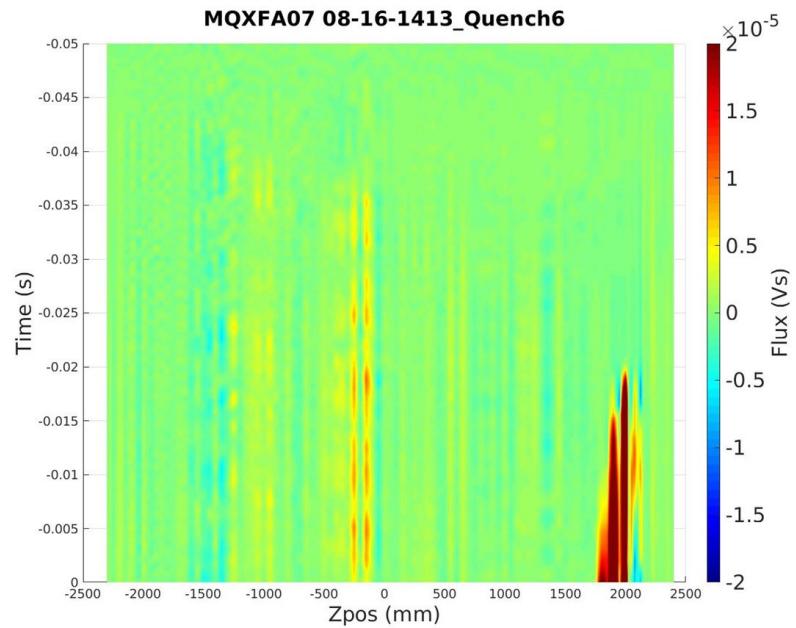
4. $I_q = 16094 \text{ A}$ Coil 214 Inner multturn

Q#5



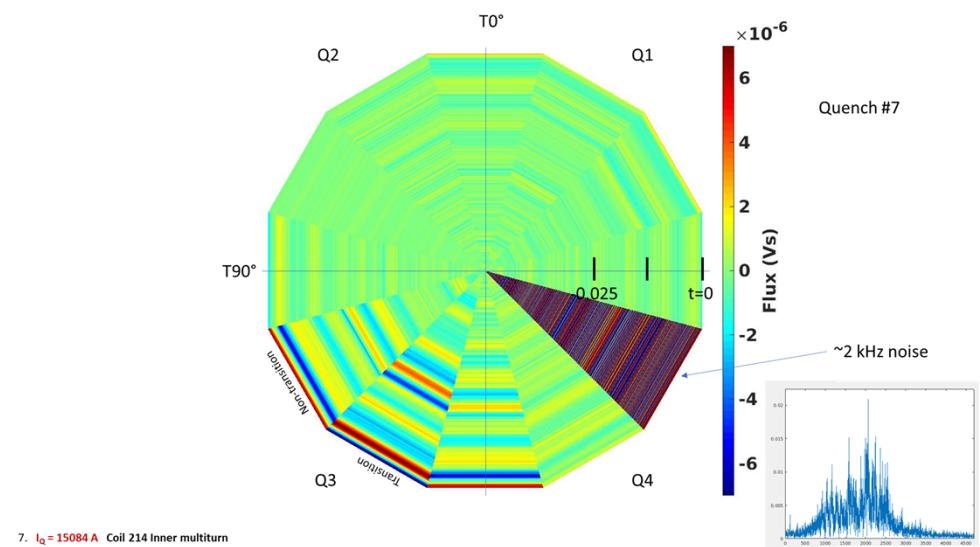
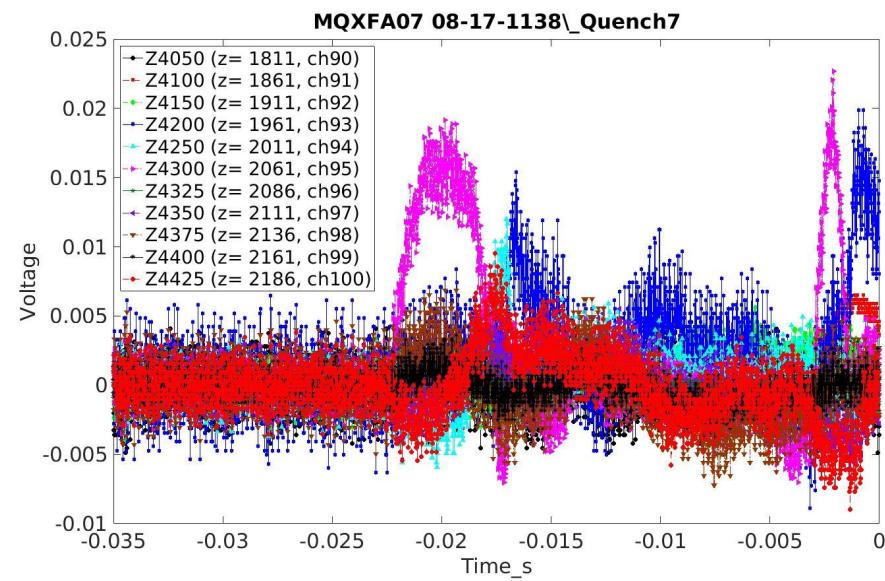
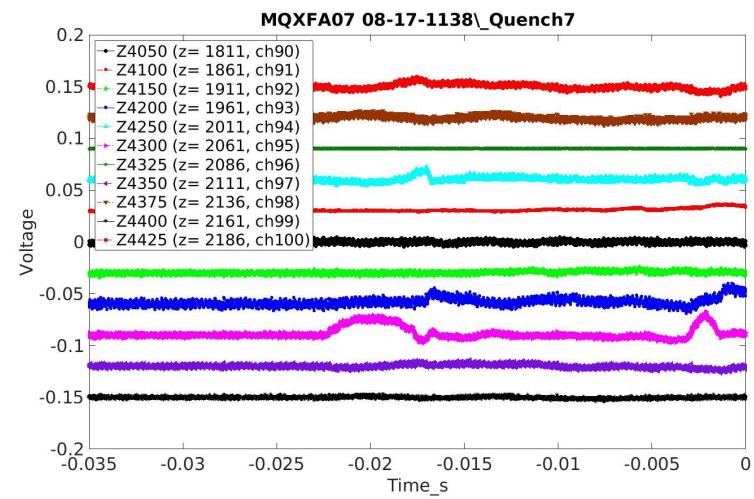
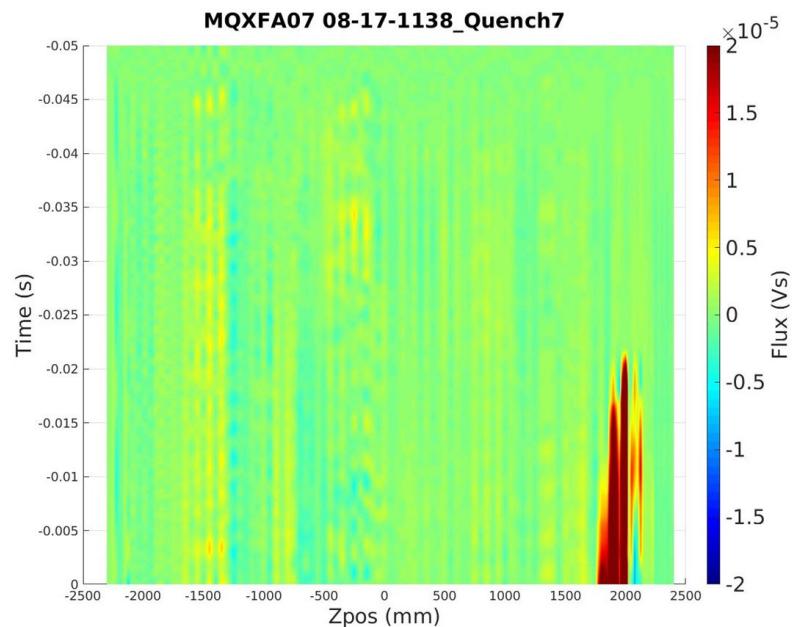
5. $I_q = 15288 \text{ A}$ Coil 214 Inner multturn

Q#6

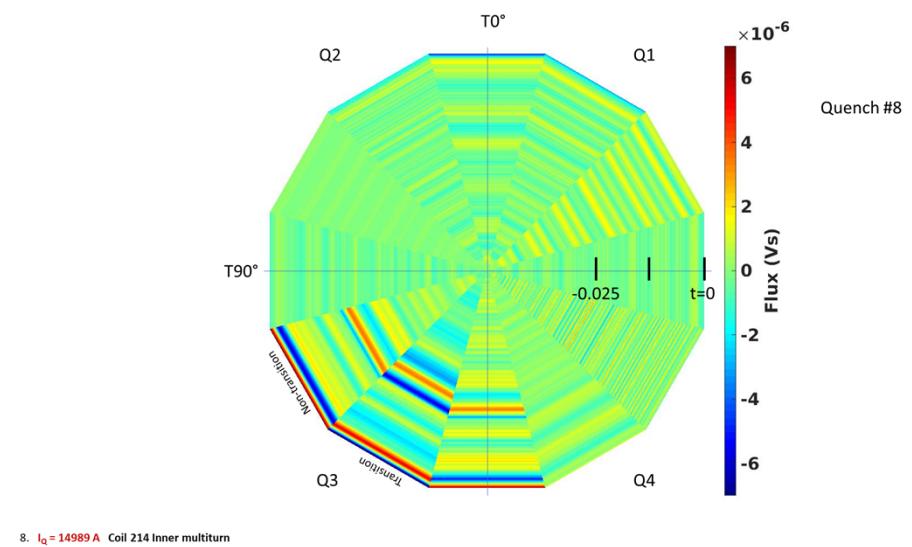
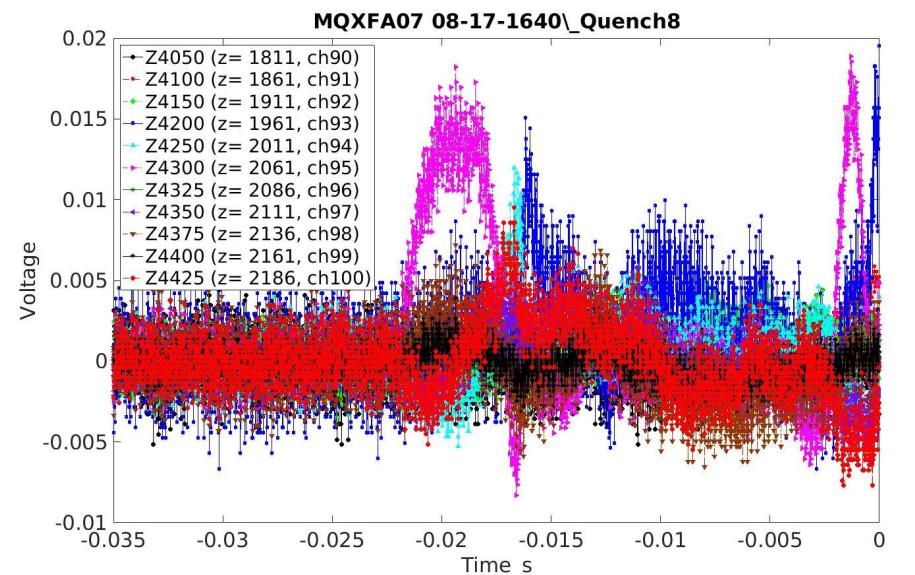
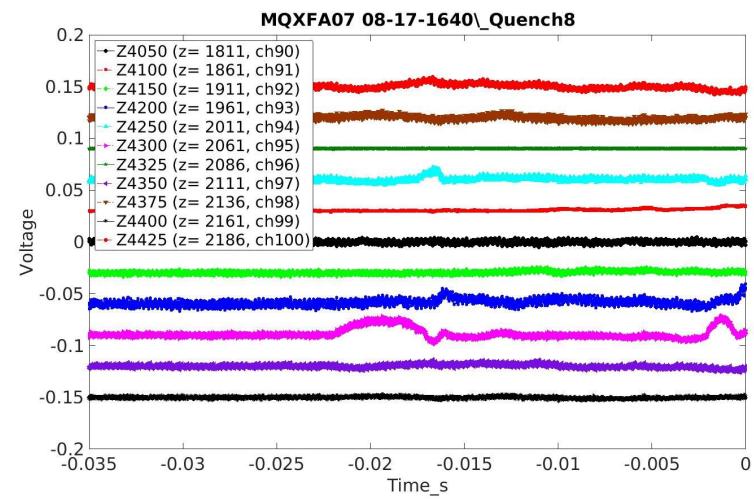
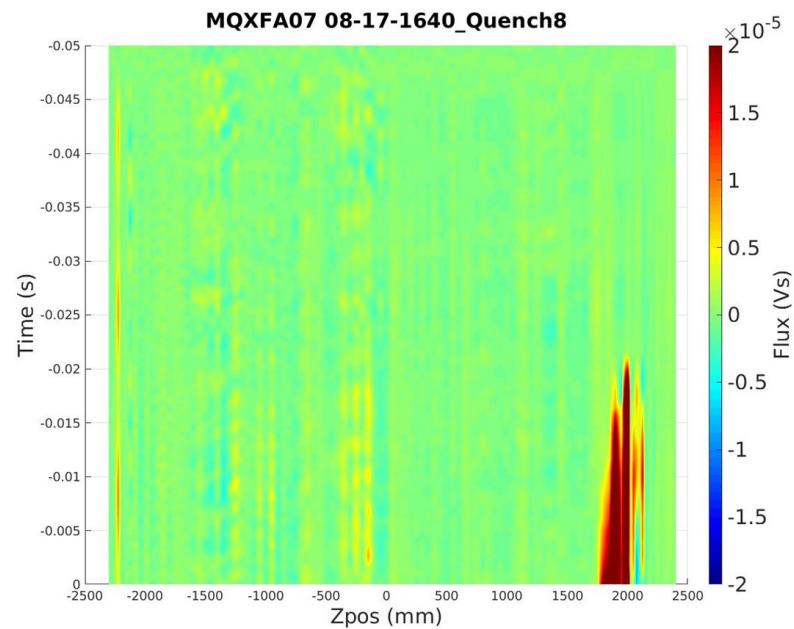


6. $I_Q = 15268 \text{ A}$ Coil 214 Inner multturn

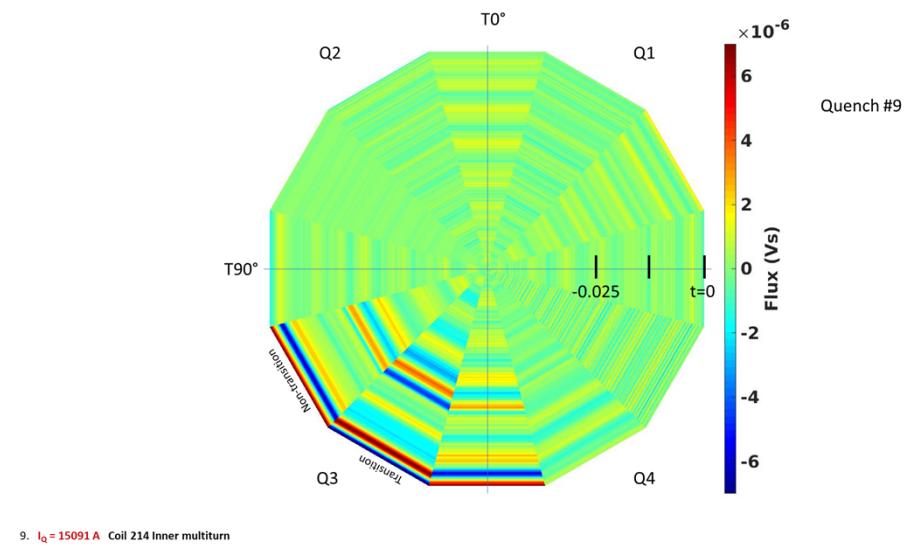
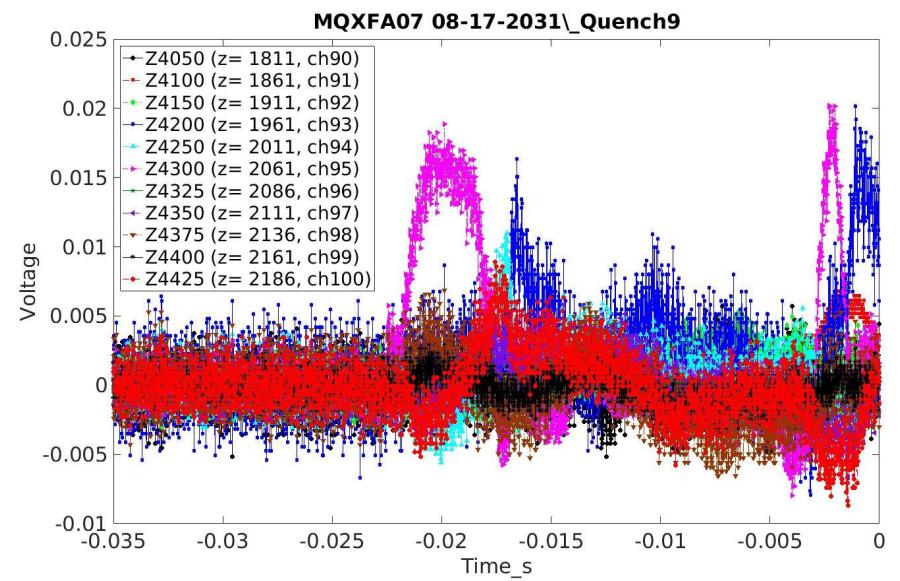
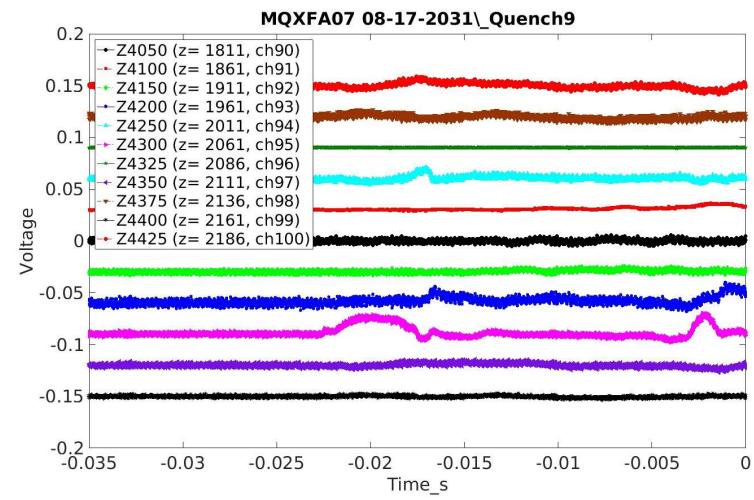
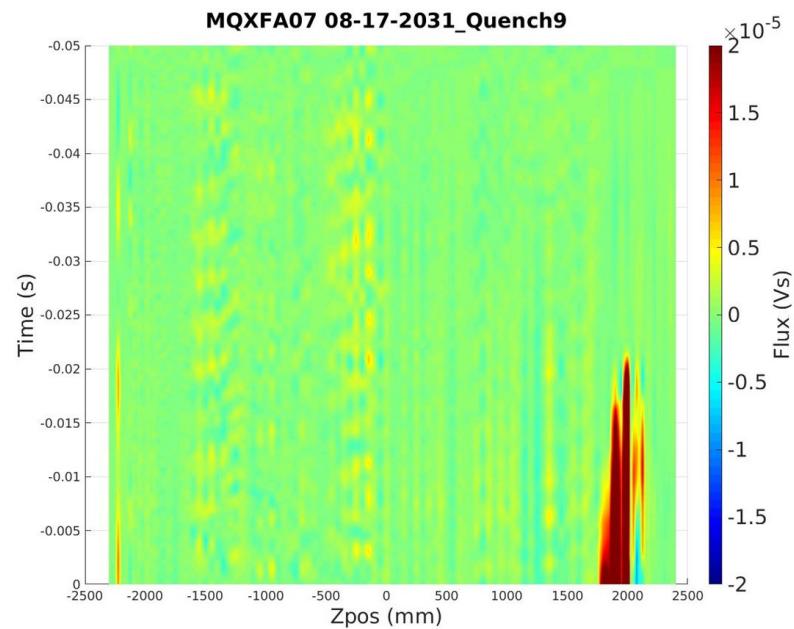
Q#7



Q#8

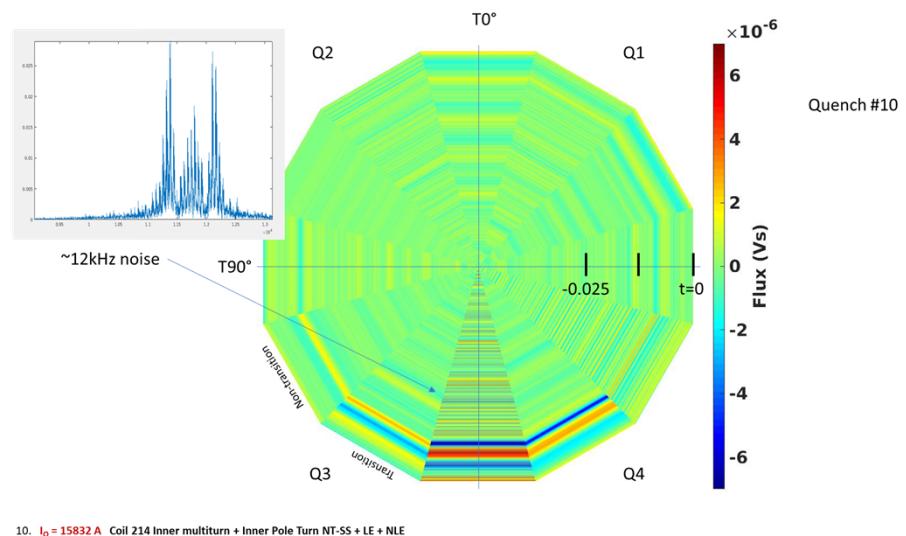
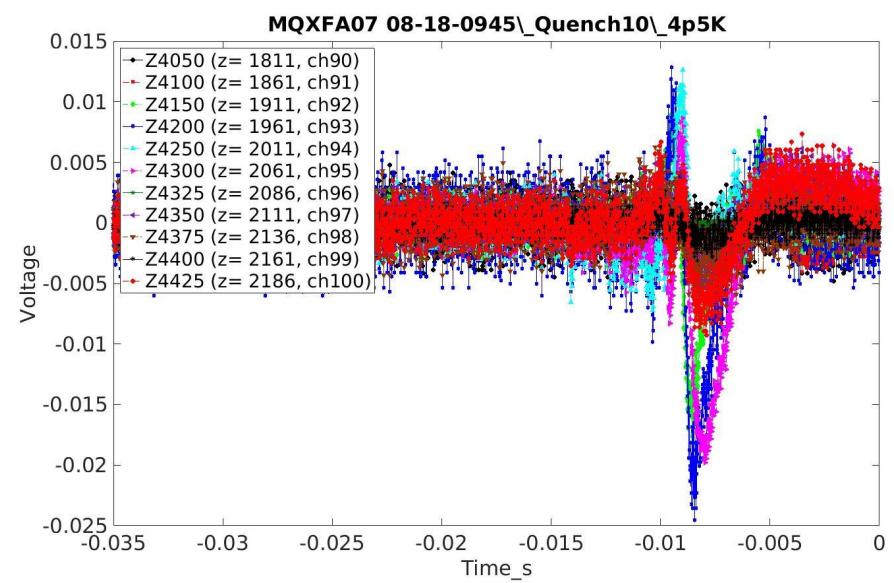
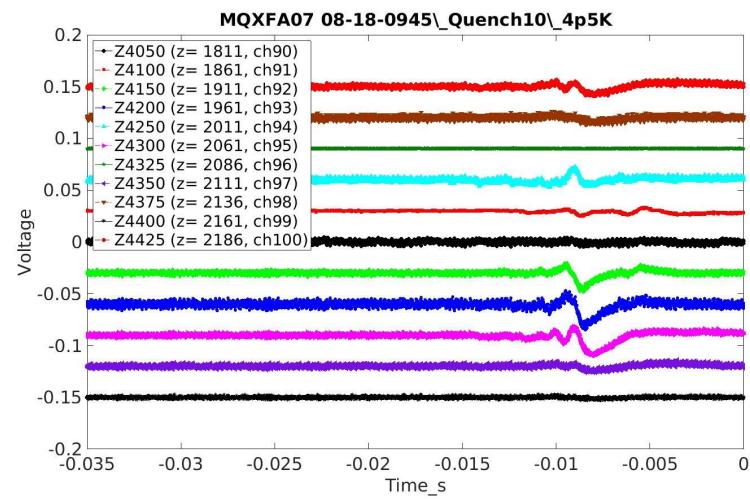
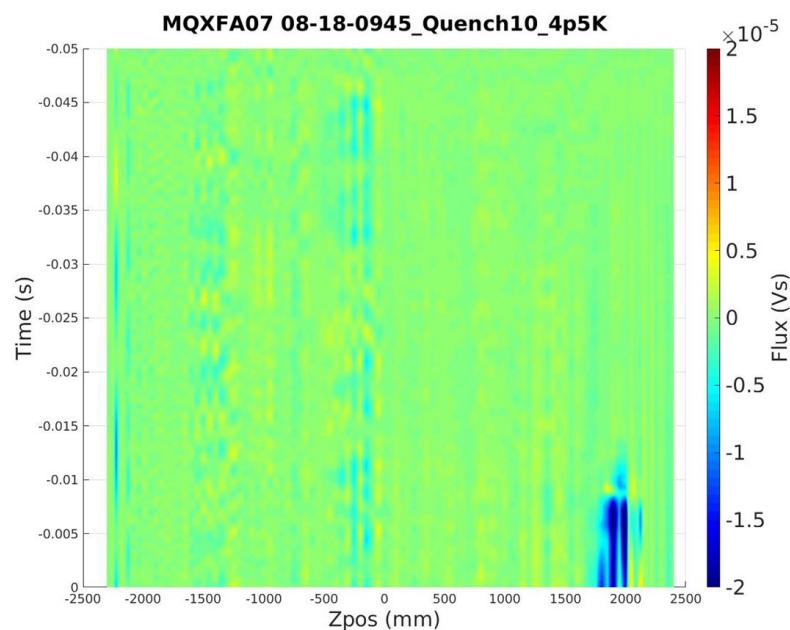


Q#9



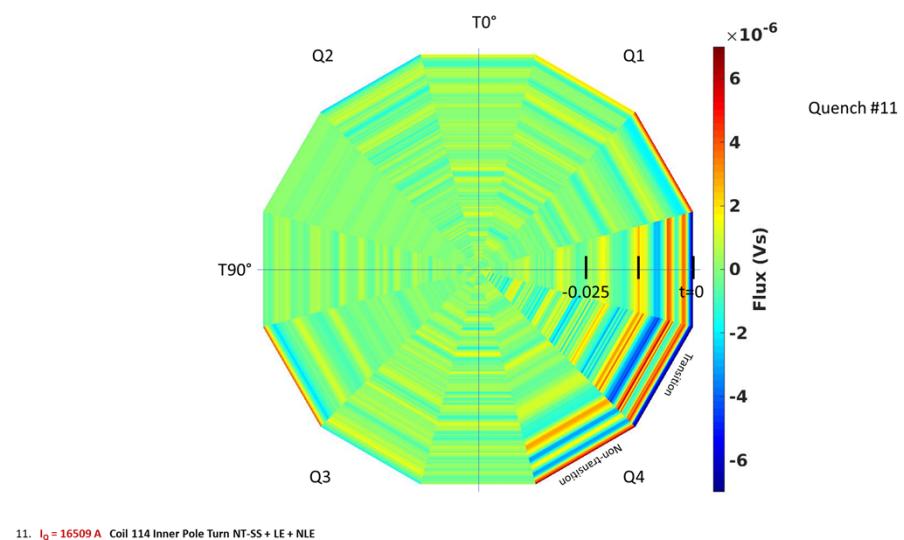
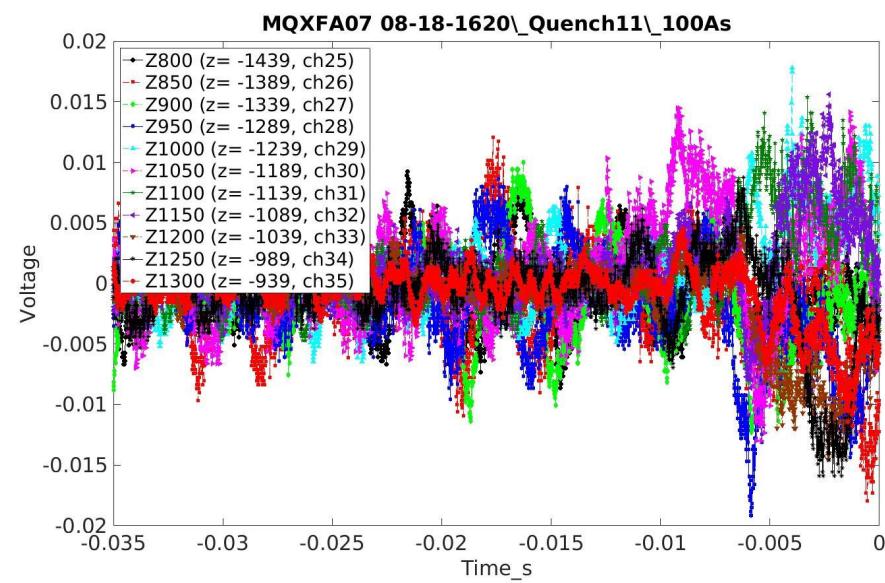
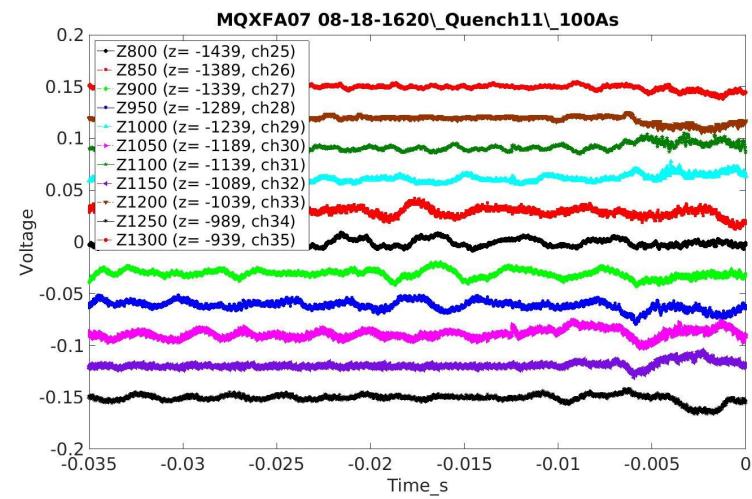
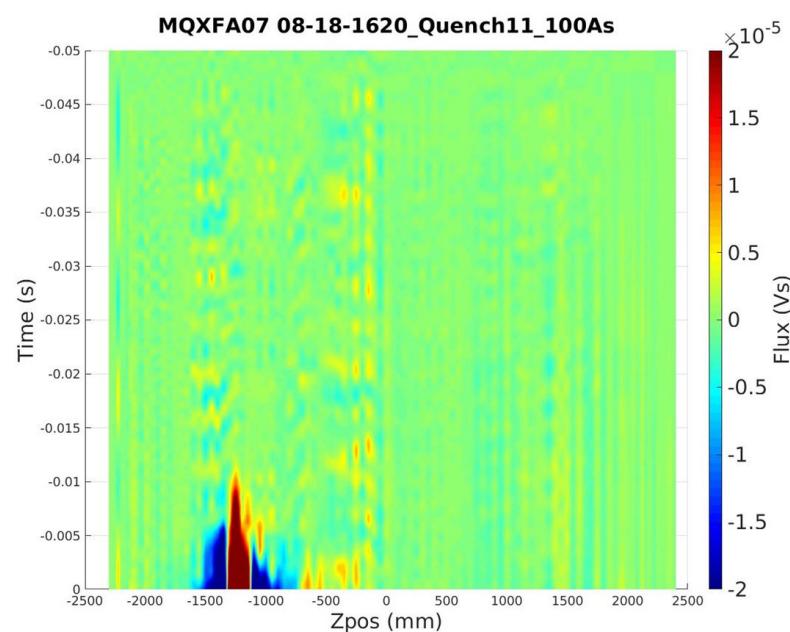
9. $I_0 = 15091 \text{ A}$ Coil 214 Inner multturn

Q#10

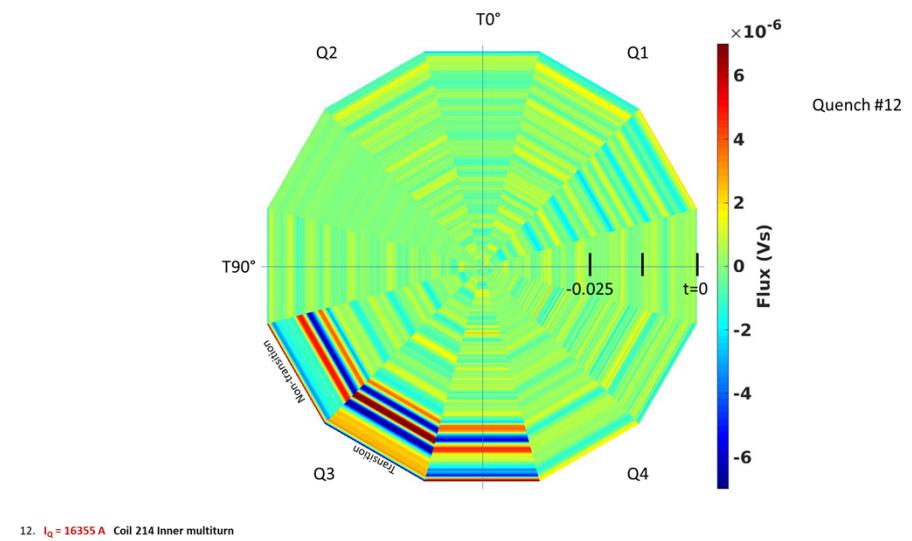
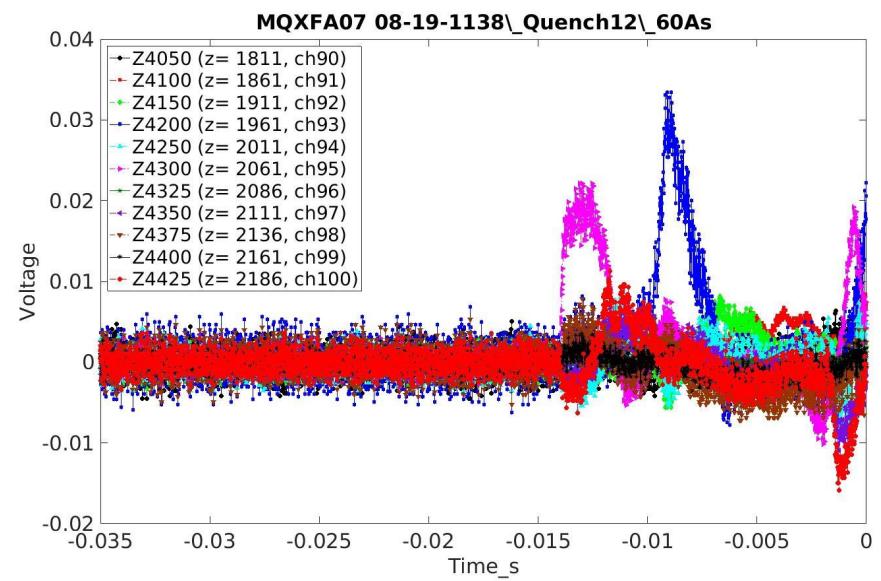
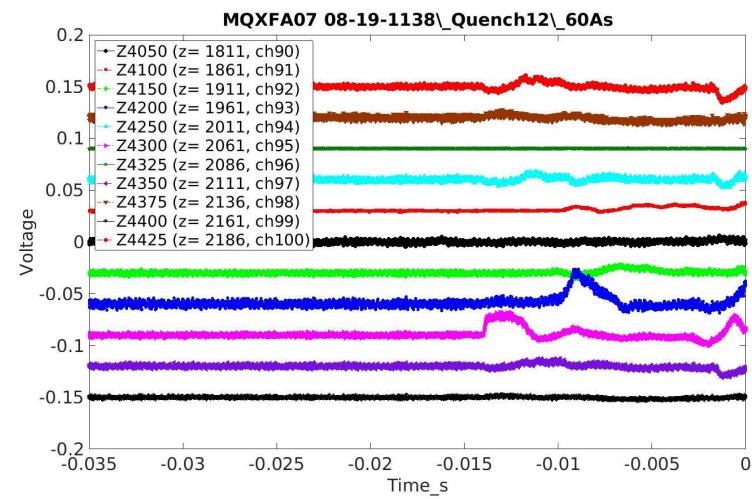
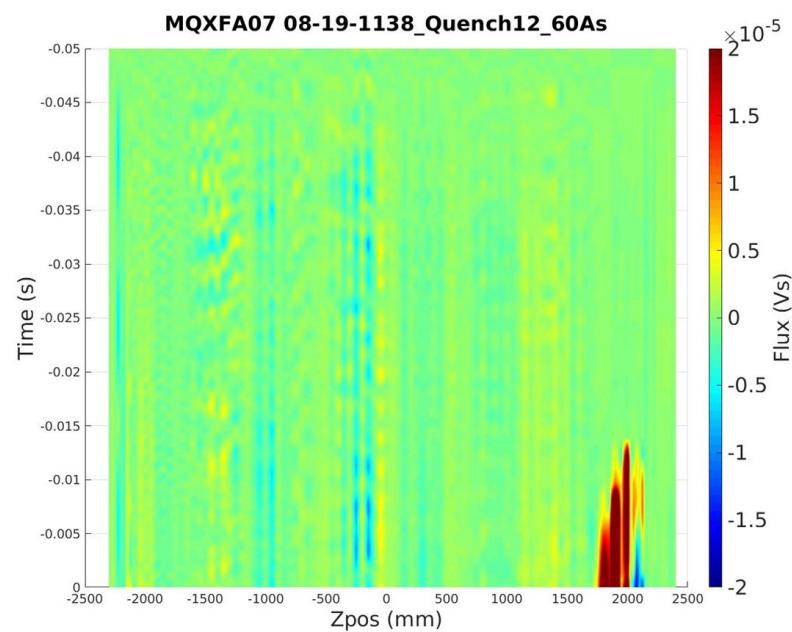


10. $I_Q = 15832 \text{ A}$ Coil 214 Inner multturn + Inner Pole Turn NT-SS + LE + NLE

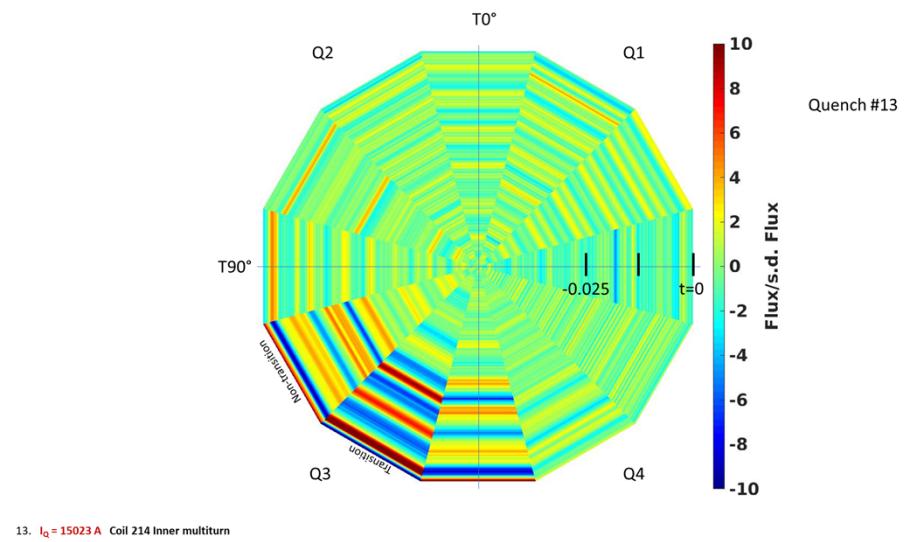
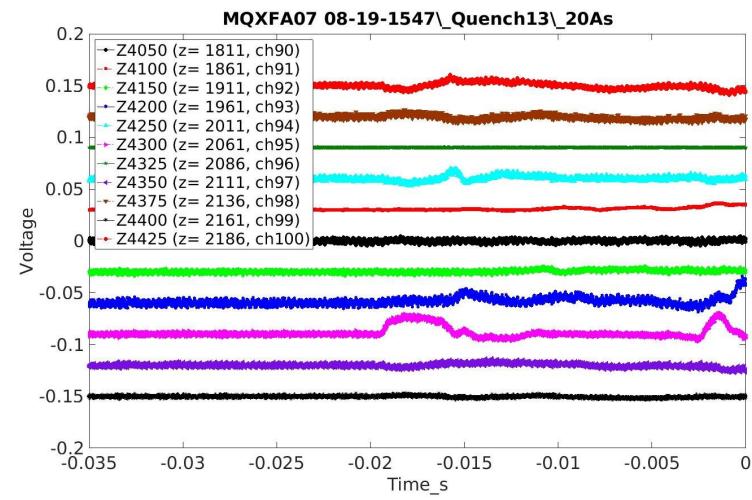
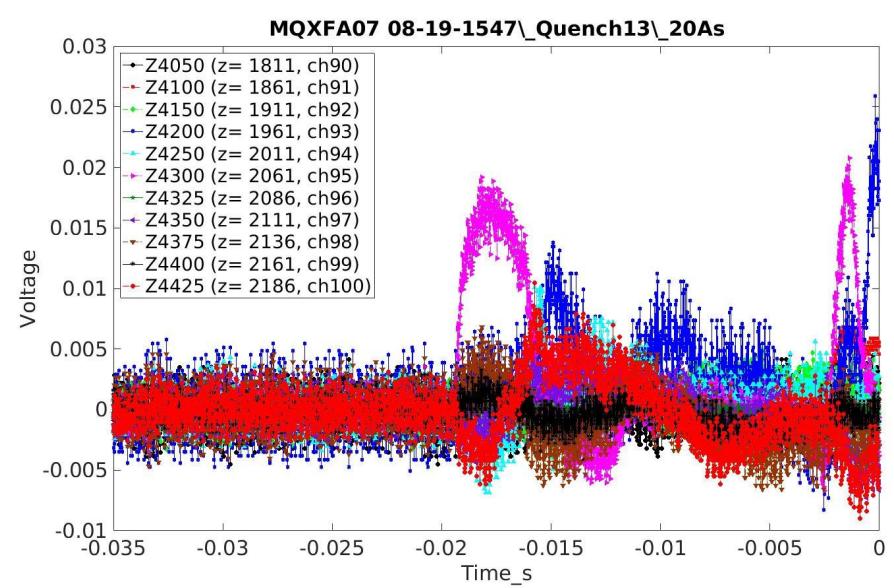
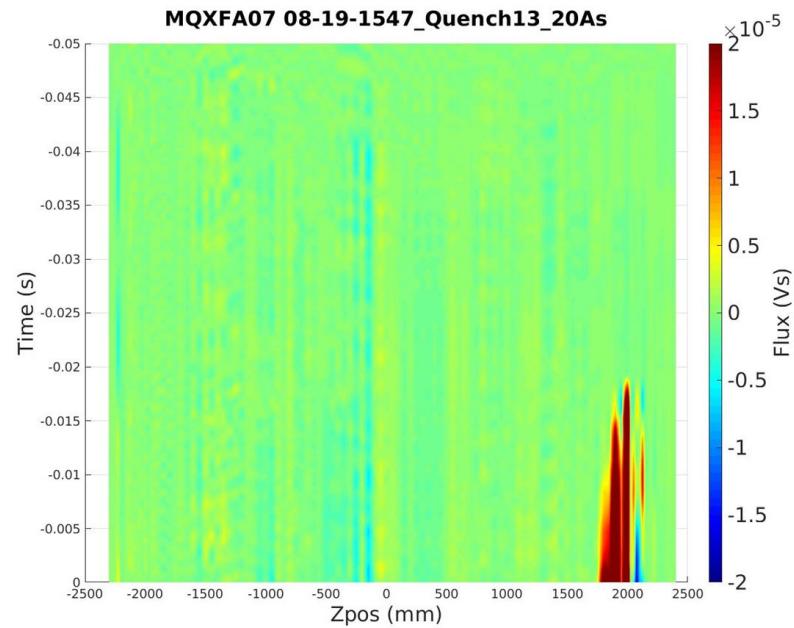
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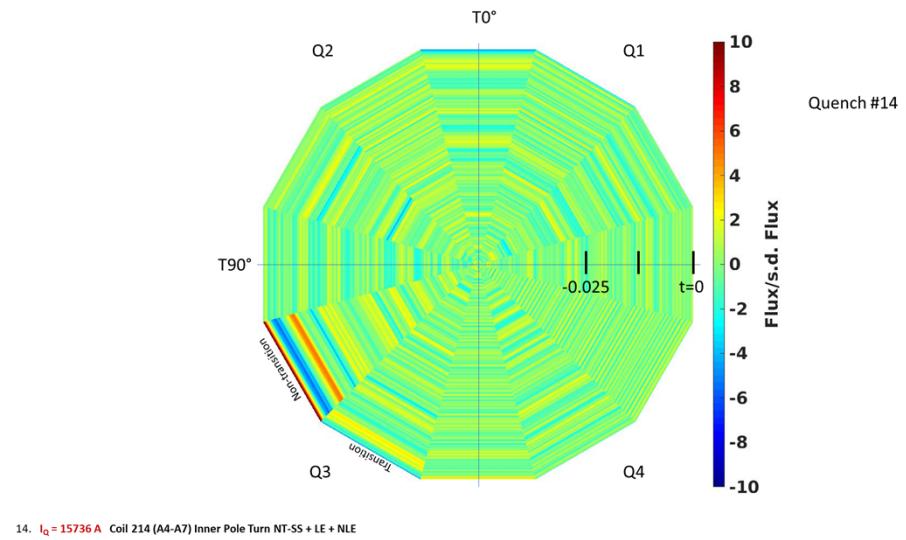
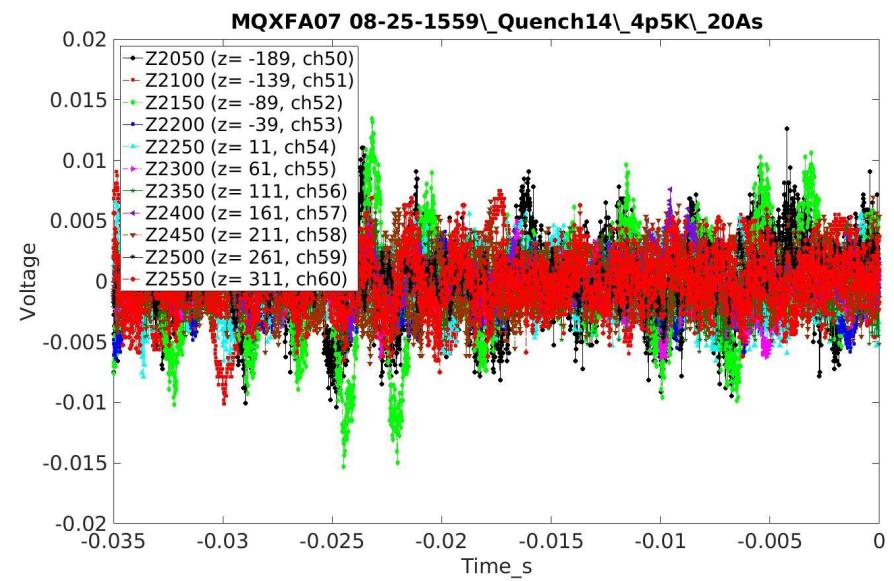
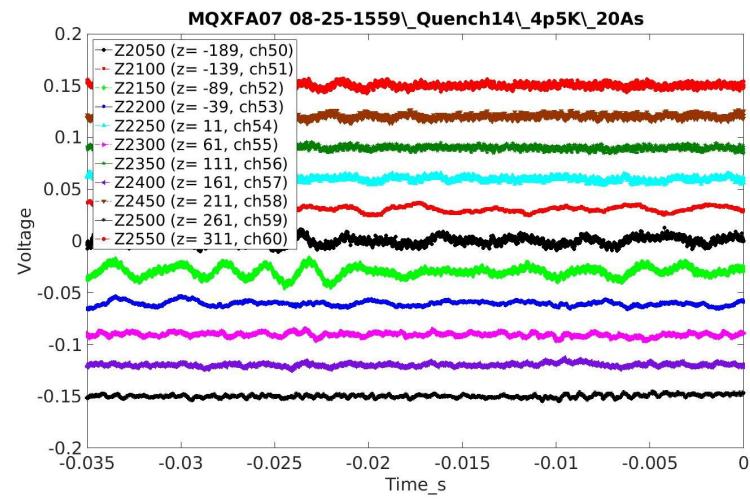
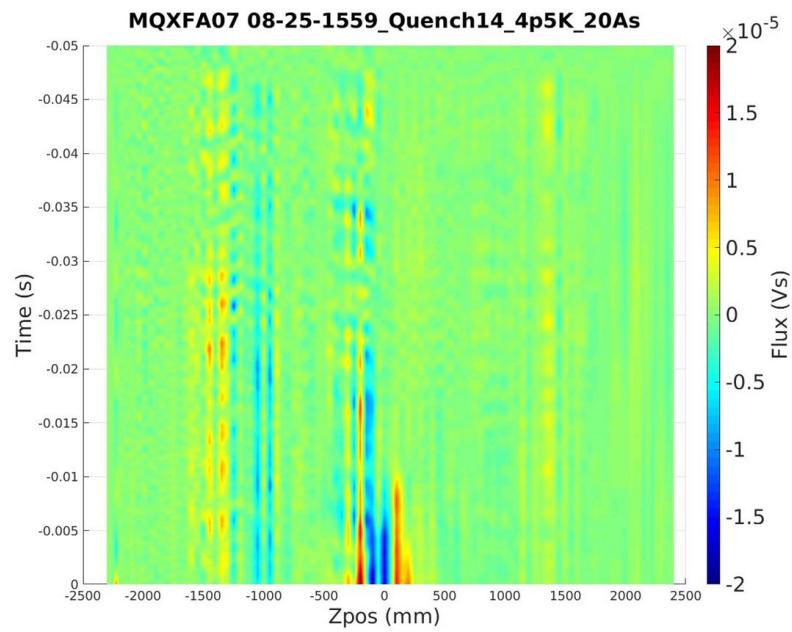
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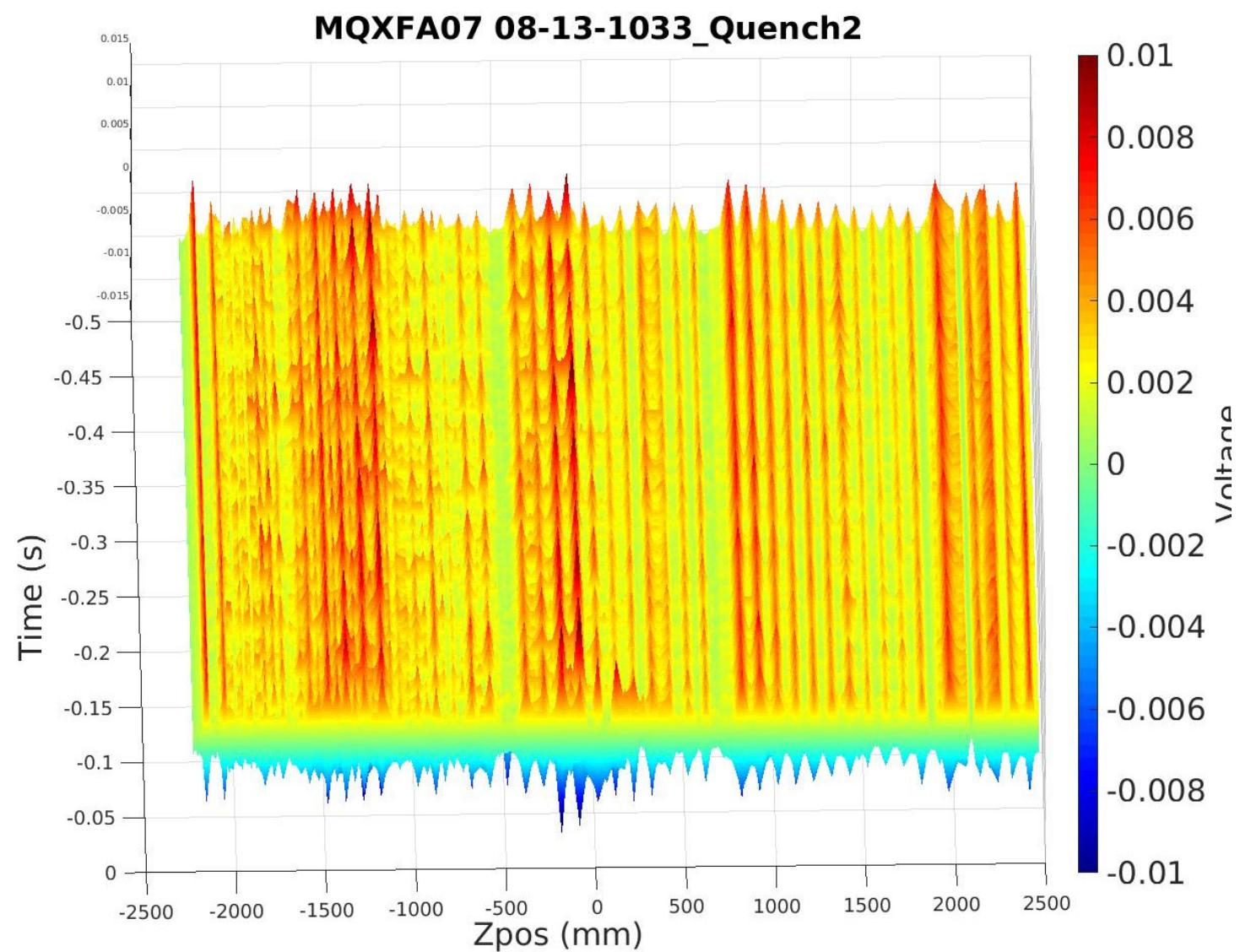
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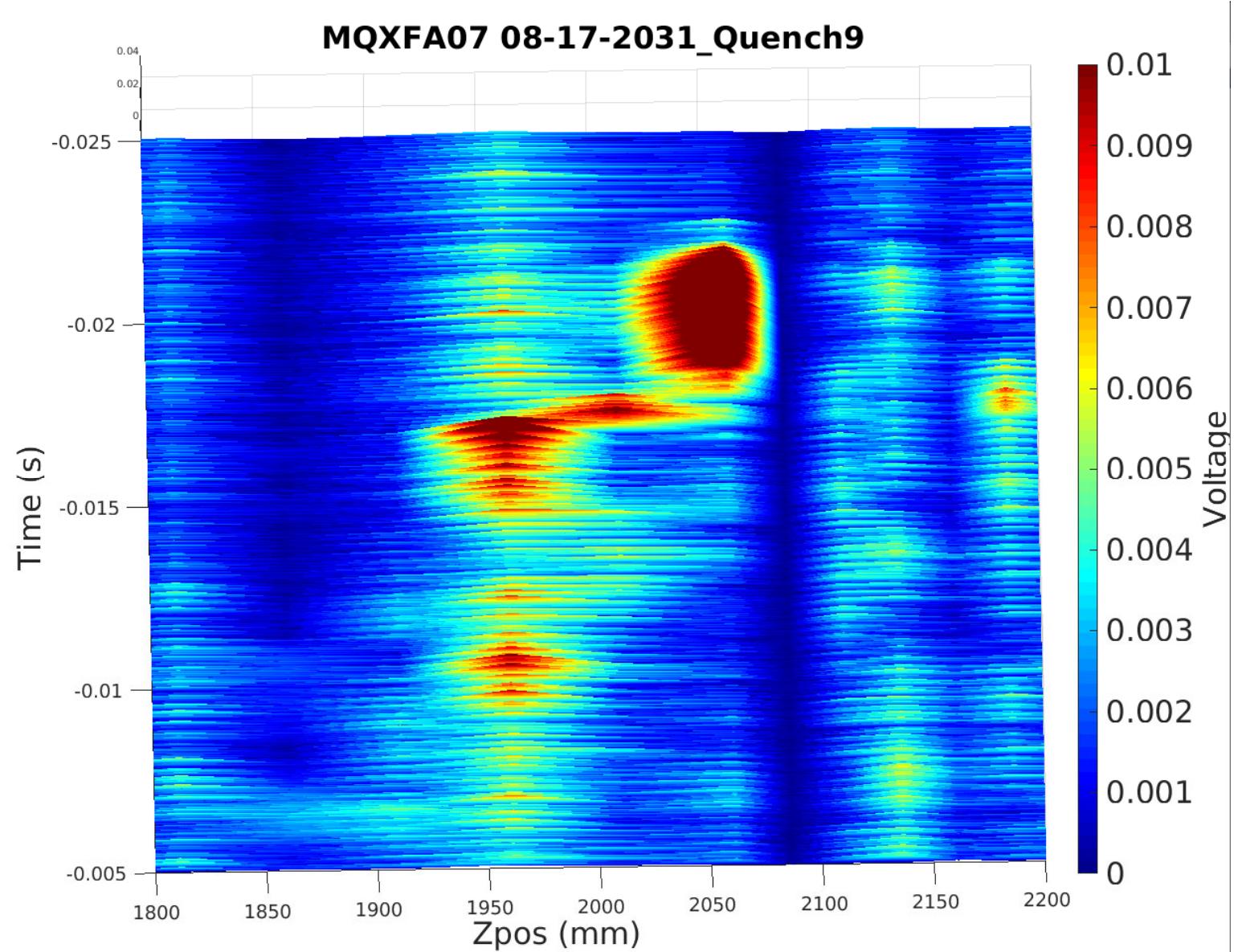


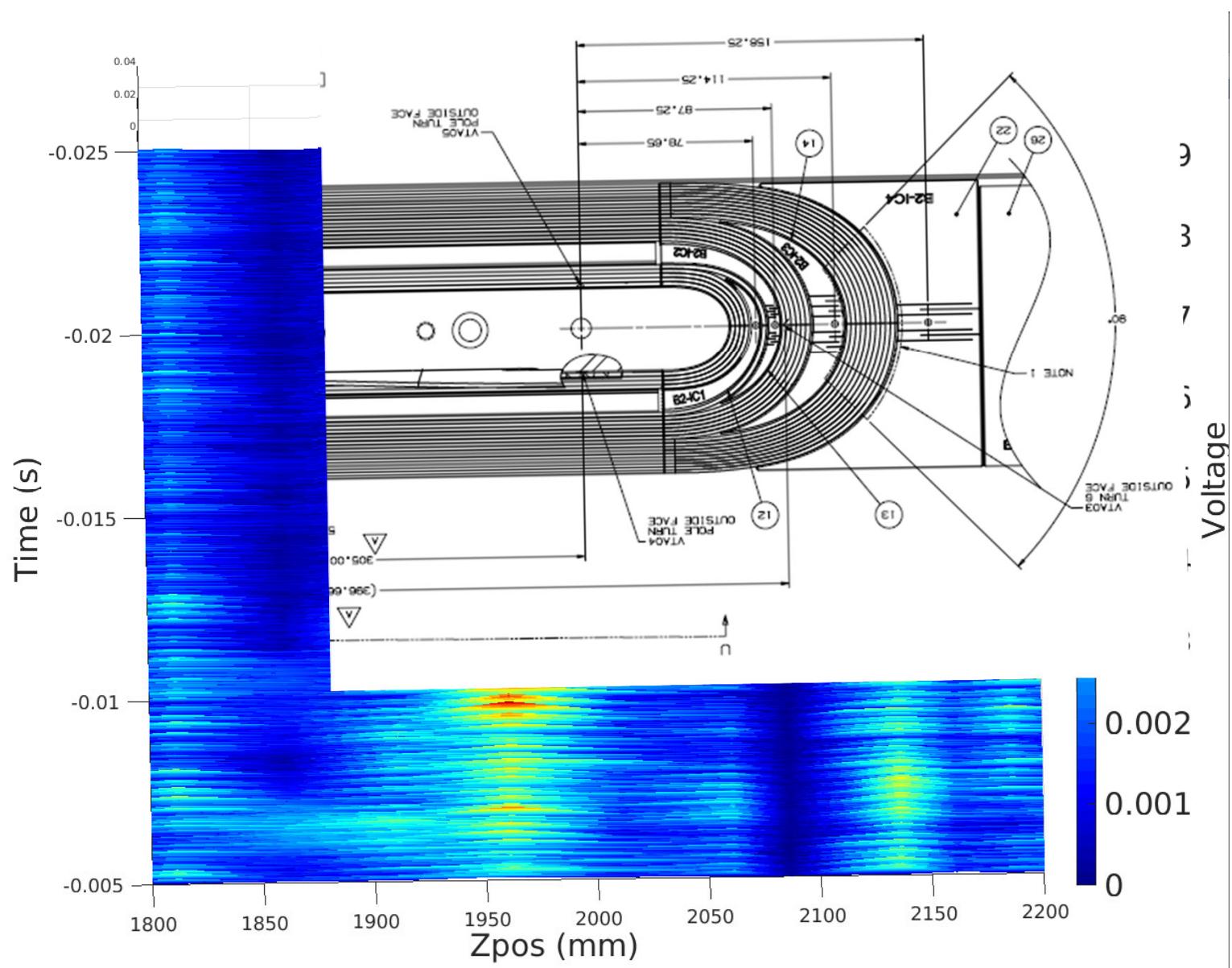
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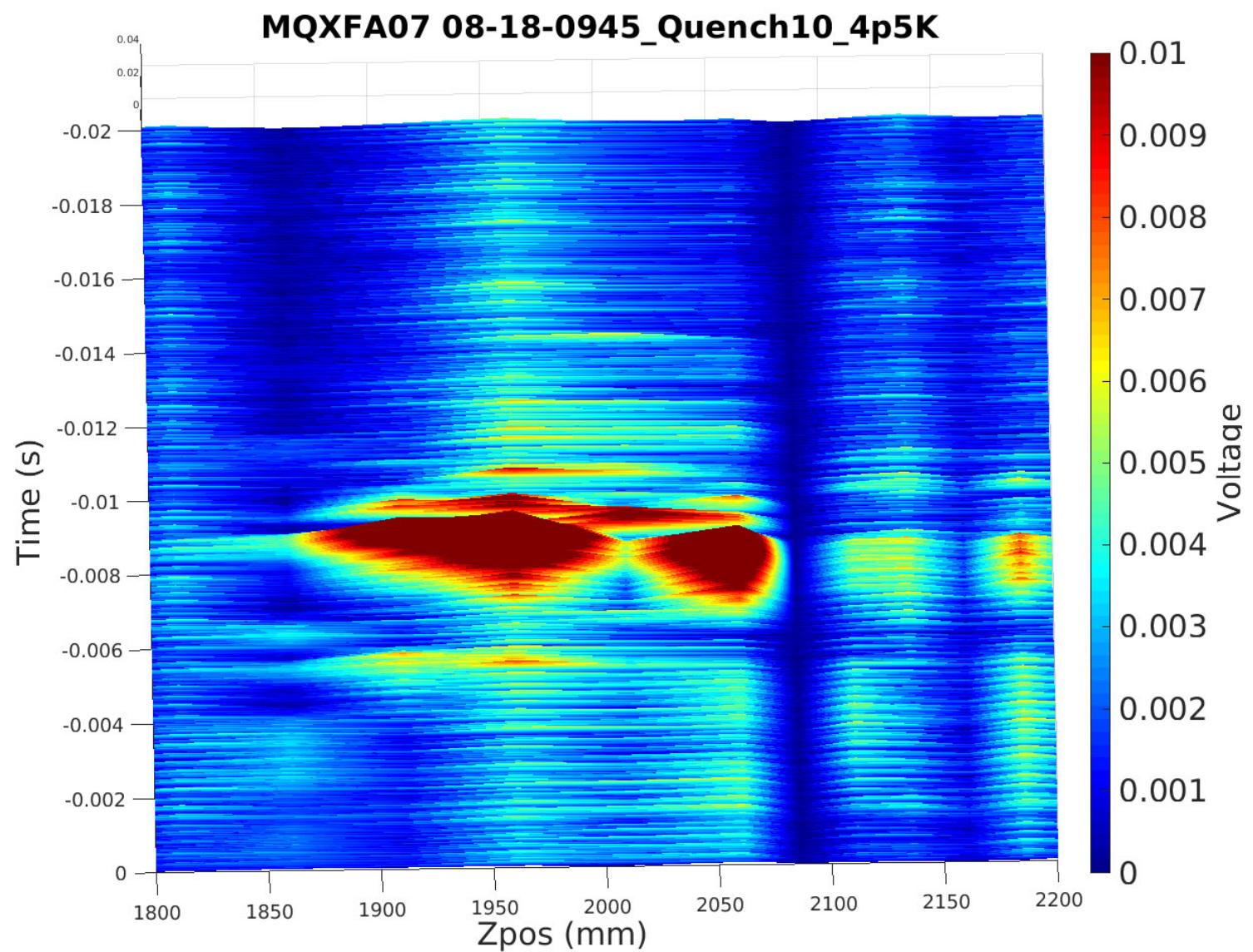


Back-up slides

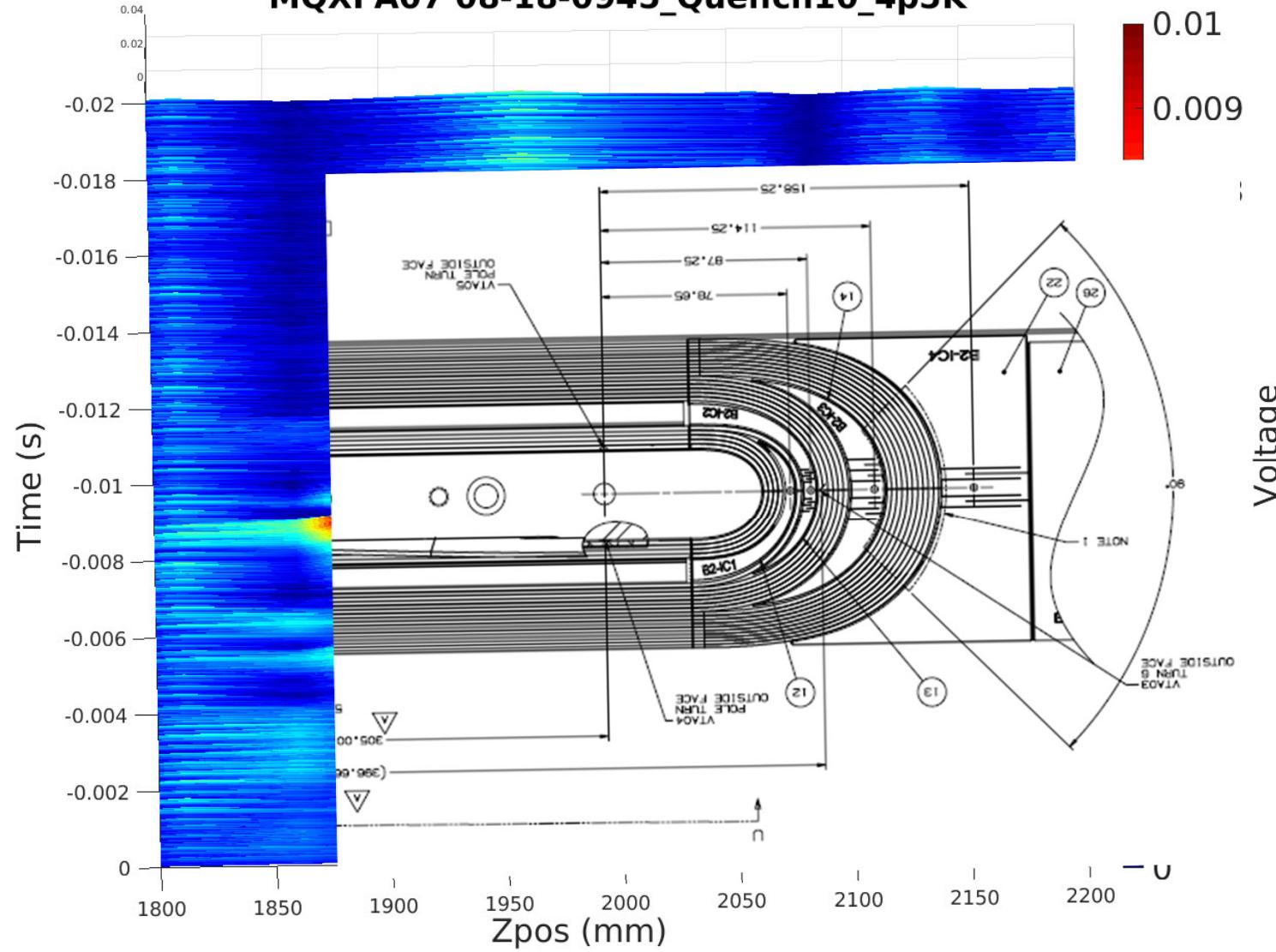




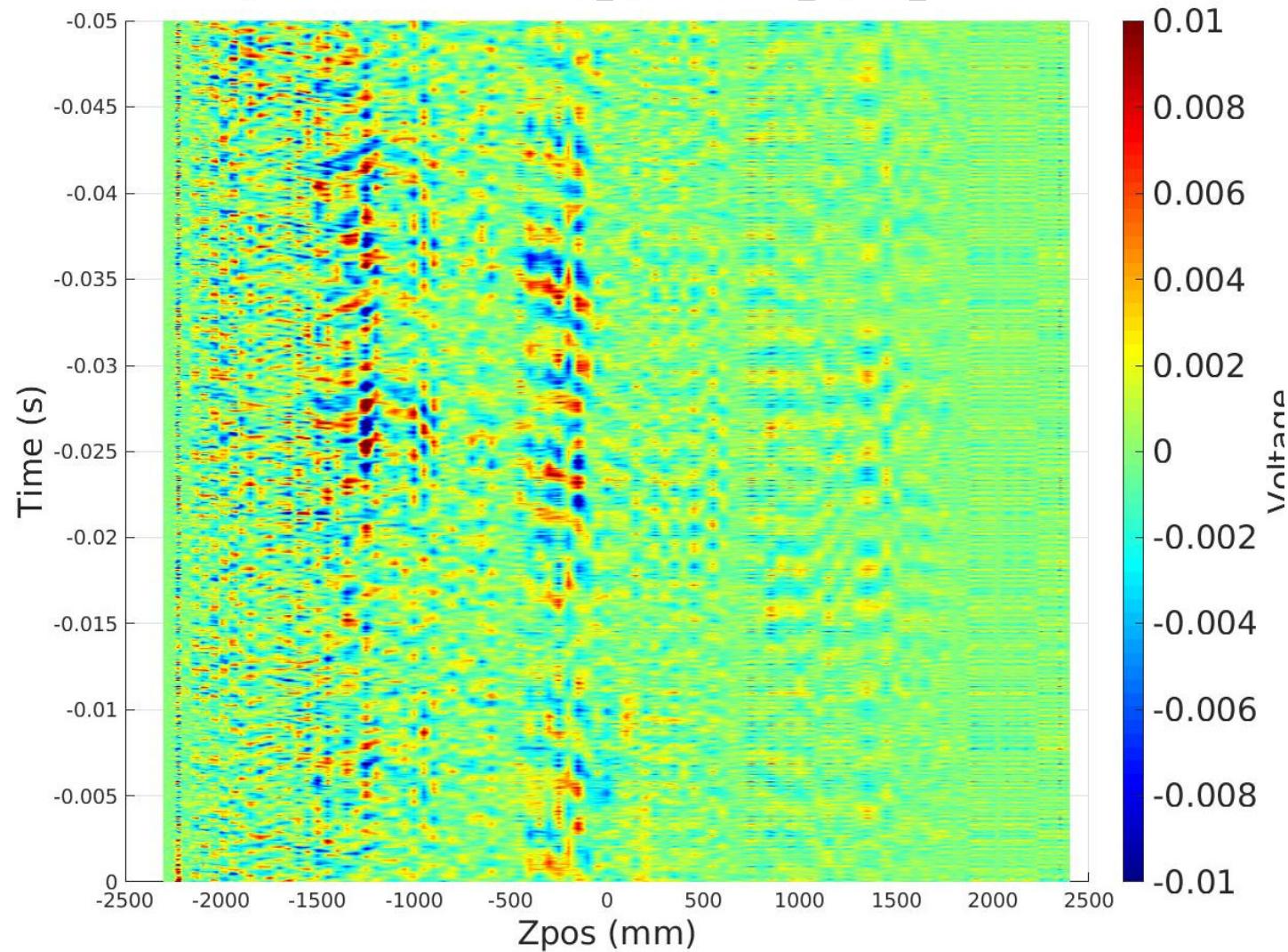




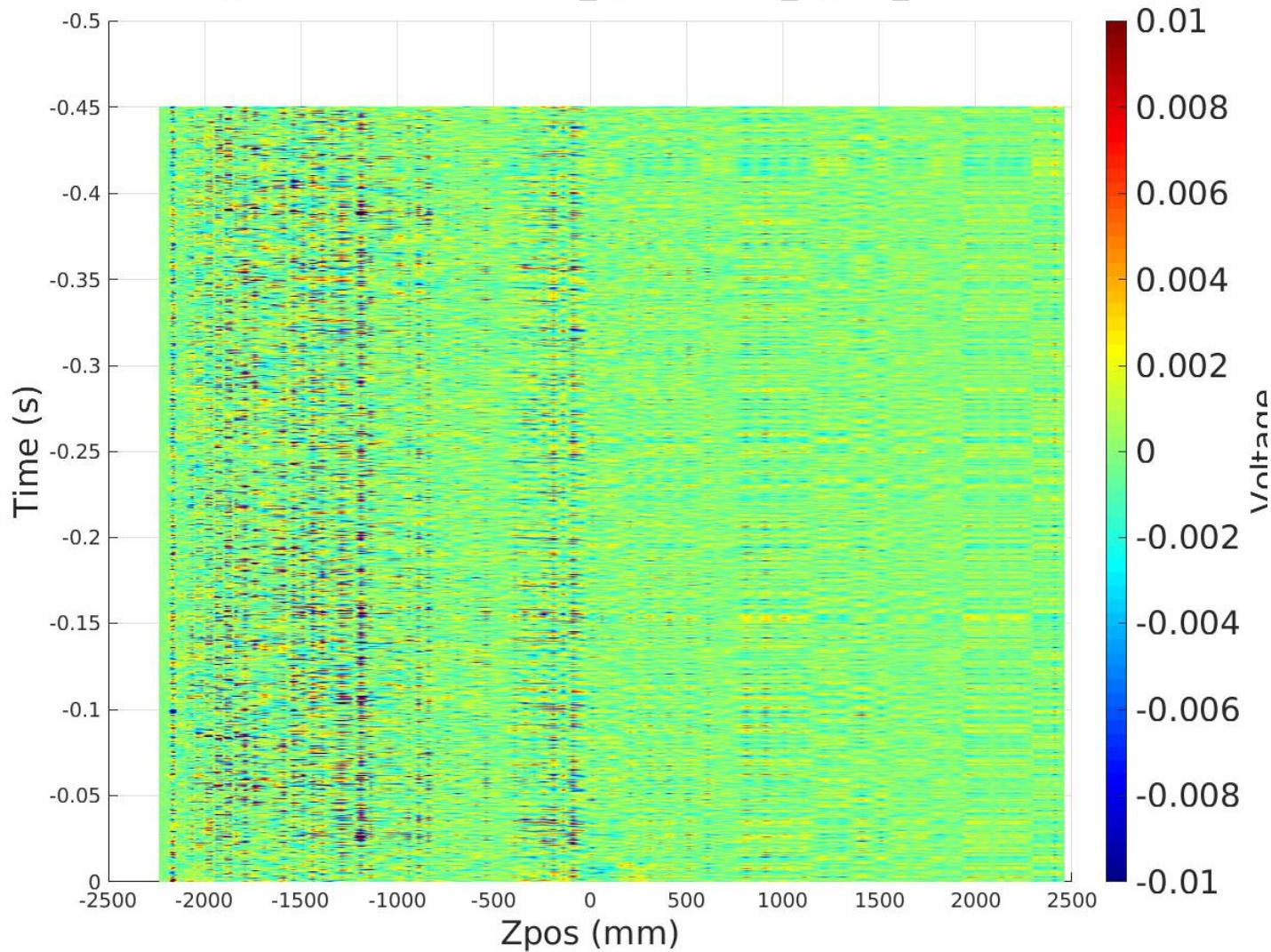
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MQXFA07 08-25-1559_Quench14_4p5K_20As



MQXFA07 08-25-1559_Quench14_4p5K_20As



MQXFA07 08-25-1559_Quench14_4p5K_20As

