Science & Technology Facilities Council

KURRI data analysis & update

S. L. Sheehy

Outline

“Action/work list” document (shared)

Comparison of corrected CO to ‘ideal’ CO without RF

Action/work list (shared)

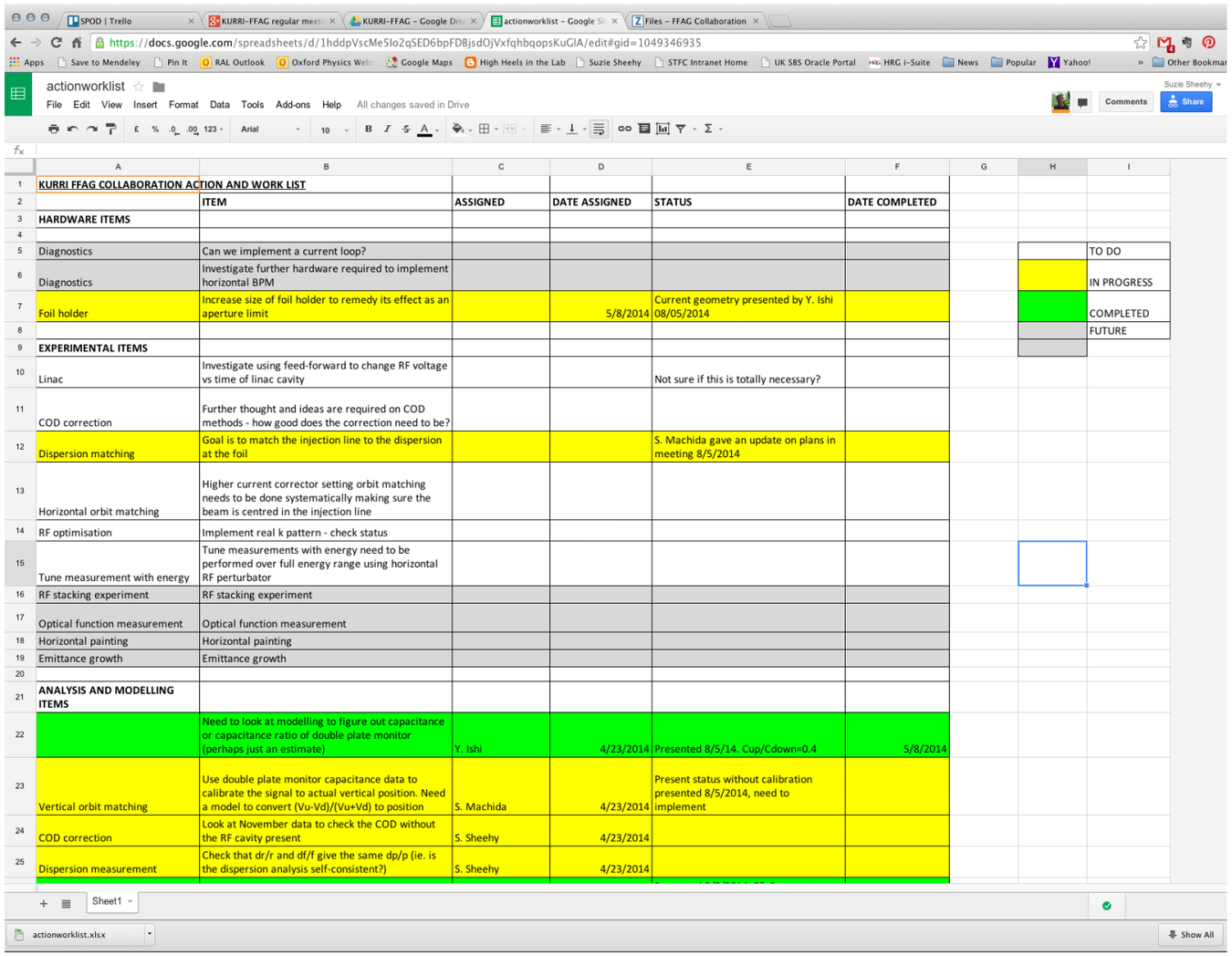
Can be accessed via the collaboration website (under ‘files’)

Anyone can access & edit with the link (!)

Has list of current analysis, simulation items, future experiment ideas etc

“Yellow” = in progress.

Should change to “green” & add note when items are done.



	A	B	C	D	E	F	G	H	I
1	KURRI FFAG COLLABORATION ACTION AND WORK LIST								
2		ITEM	ASSIGNED	DATE ASSIGNED	STATUS	DATE COMPLETED			
3	HARDWARE ITEMS								
4									
5	Diagnostics	Can we implement a current loop?							
6	Diagnostics	Investigate further hardware required to implement horizontal BPM							
7	Foil holder	Increase size of foil holder to remedy its effect as an aperture limit		5/8/2014	Current geometry presented by Y. Ishi 08/05/2014				
8									
9	EXPERIMENTAL ITEMS								
10	Linac	Investigate using feed-forward to change RF voltage vs time of linac cavity			Not sure if this is totally necessary?				
11	COD correction	Further thought and ideas are required on COD methods - how good does the correction need to be?							
12	Dispersion matching	Goal is to match the injection line to the dispersion at the foil			S. Machida gave an update on plans in meeting 8/5/2014				
13	Horizontal orbit matching	Higher current corrector setting orbit matching needs to be done systematically making sure the beam is centred in the injection line							
14	RF optimisation	Implement real k pattern - check status							
15	Tune measurement with energy	Tune measurements with energy need to be performed over full energy range using horizontal RF perturbator							
16	RF stacking experiment	RF stacking experiment							
17	Optical function measurement	Optical function measurement							
18	Horizontal painting	Horizontal painting							
19	Emittance growth	Emittance growth							
20									
21	ANALYSIS AND MODELLING ITEMS								
22		Need to look at modelling to figure out capacitance or capacitance ratio of double plate monitor (perhaps just an estimate)	Y. Ishi	4/23/2014	Presented 8/5/14. Cup/Cdown=0.4	5/8/2014			
23	Vertical orbit matching	Use double plate monitor capacitance data to calibrate the signal to actual vertical position. Need a model to convert (Vu-Vd)/(Vu+Vd) to position	S. Machida	4/23/2014	Present status without calibration presented 8/5/2014, need to implement				
24	COD correction	Look at November data to check the COD without the RF cavity present	S. Sheehy	4/23/2014					
25	Dispersion measurement	Check that dr/r and df/f give the same dp/p (ie. is the dispersion analysis self-consistent?)	S. Sheehy	4/23/2014					

	TO DO
	IN PROGRESS
	COMPLETED
	FUTURE

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1. Corrected COD vs ‘ideal’

- I compared the closed orbit measurement without the RF cavity present (Nov ’13 data) to the correction schemes applied in March ’14.

- Nov’13 (6/11/13) data was measured with 3 probes to see point where beam no longer circulated. (No acceleration!)

- March '14 data taken with acceleration to see CO with radius

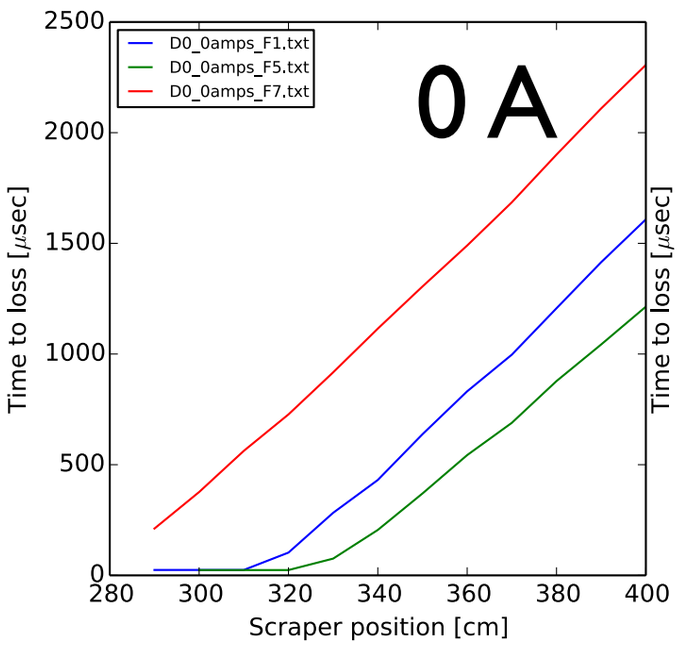
- Probe position calibrations (from my notes 19/11/13):

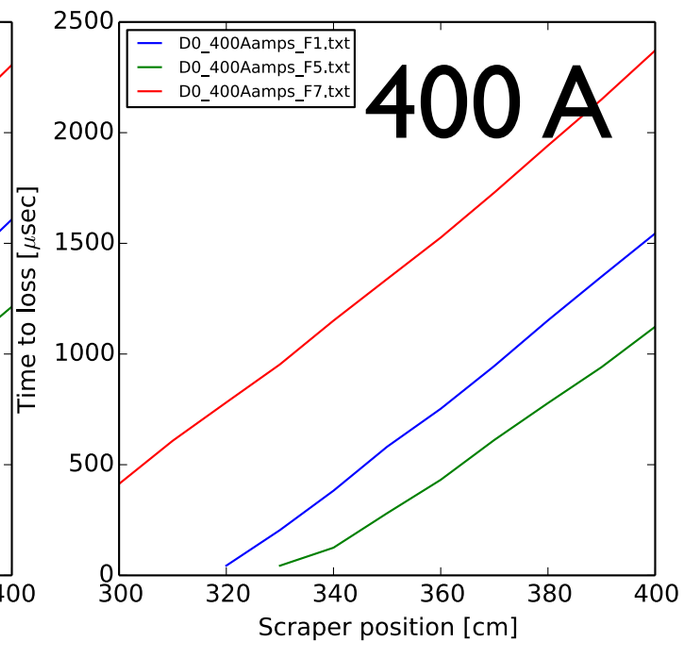
  F1 R=4302.5 + x

  F5, R=4302.5 + x

  F7, R=4295.0 + x

Corrected COD from March ‘14



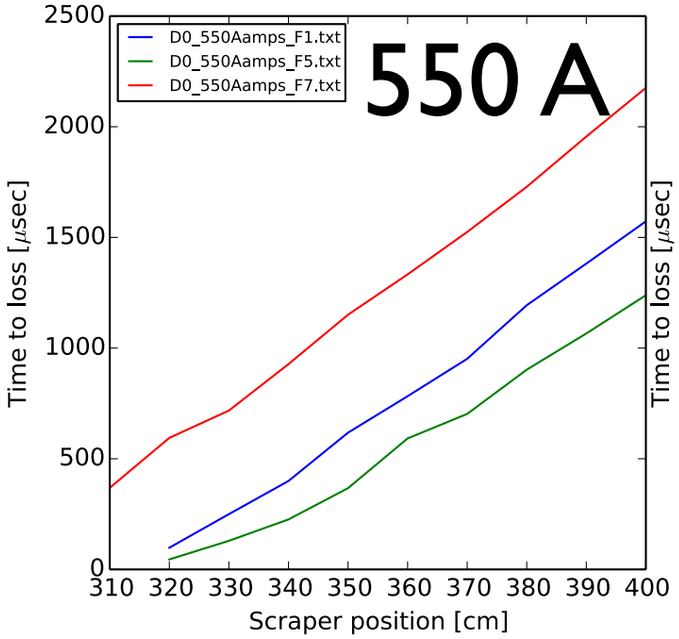


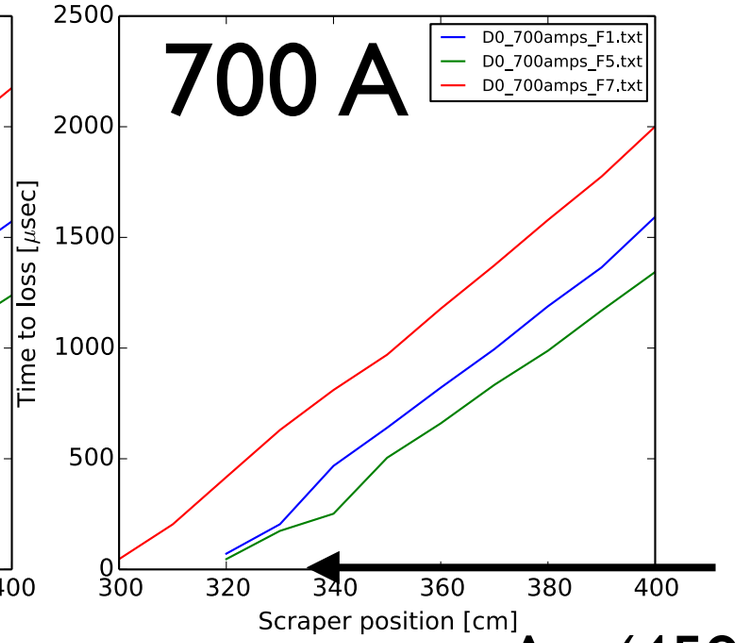
F1 R=4302.5 + x
F5, R=4302.5 + x
F7, R=4295.0 + x

F7 line is actually 7.5mm further 'in' than other lines...

Are these correct?

Nb. F7 opposite foil





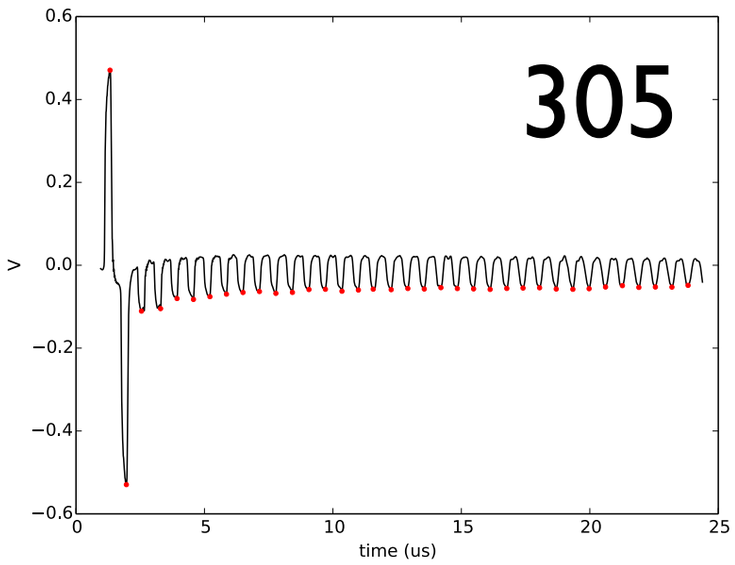
injection (smallest t)

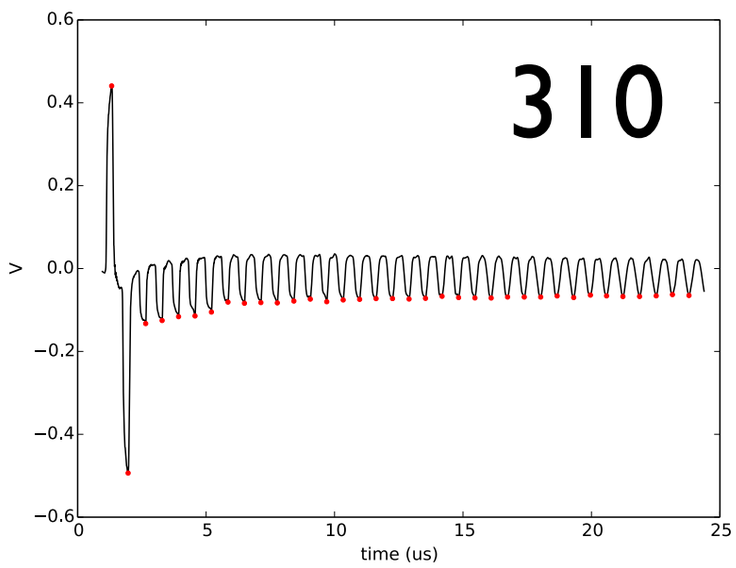
Avg(4595,4622.5,4622.5)=**4613.3mm**

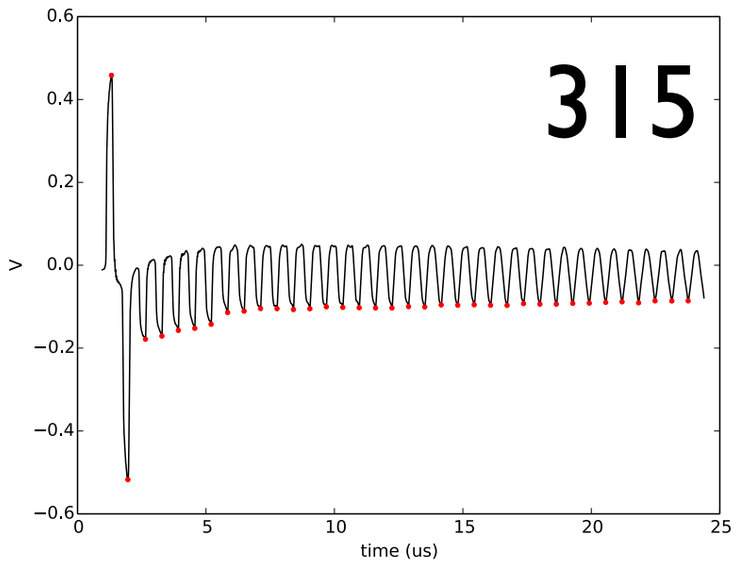
Example COD data from 6/11/13

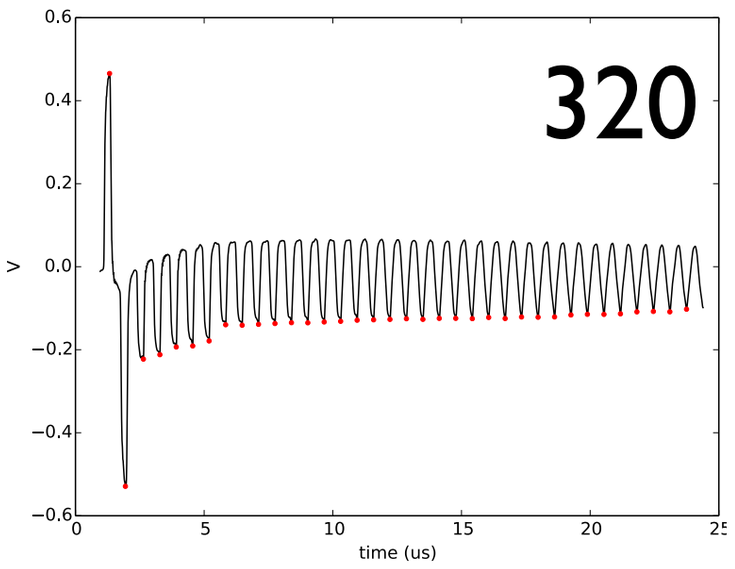
F7 (INU)

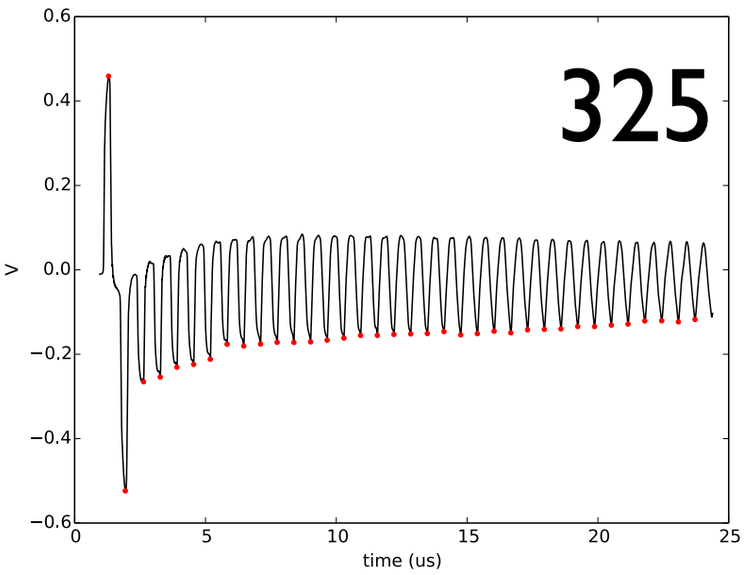
nb: opposite inj. foil so can't go in further!

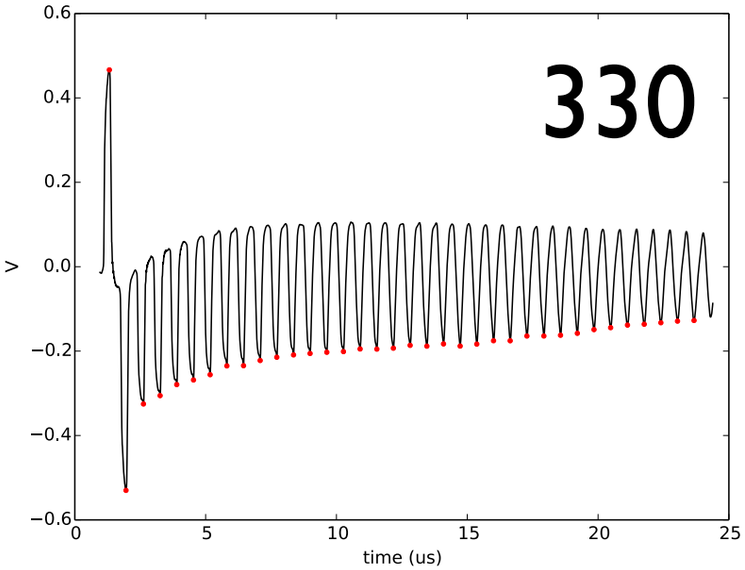












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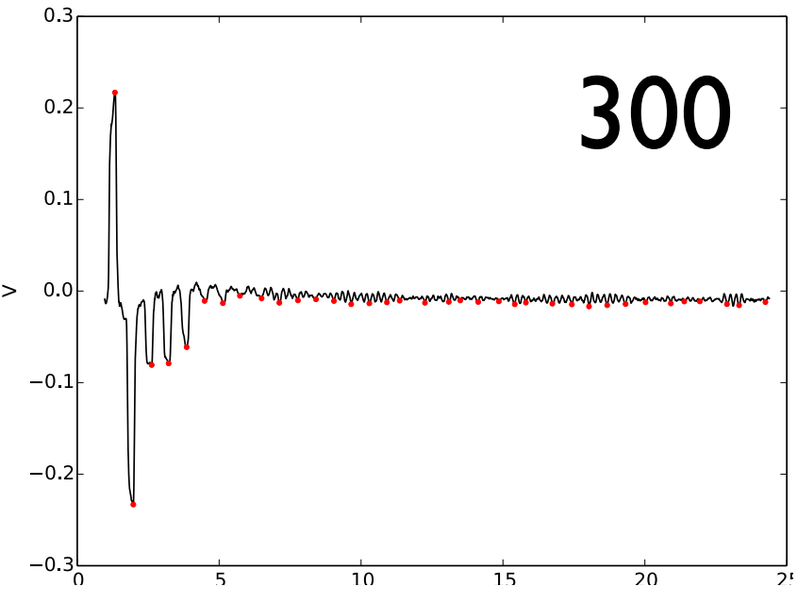
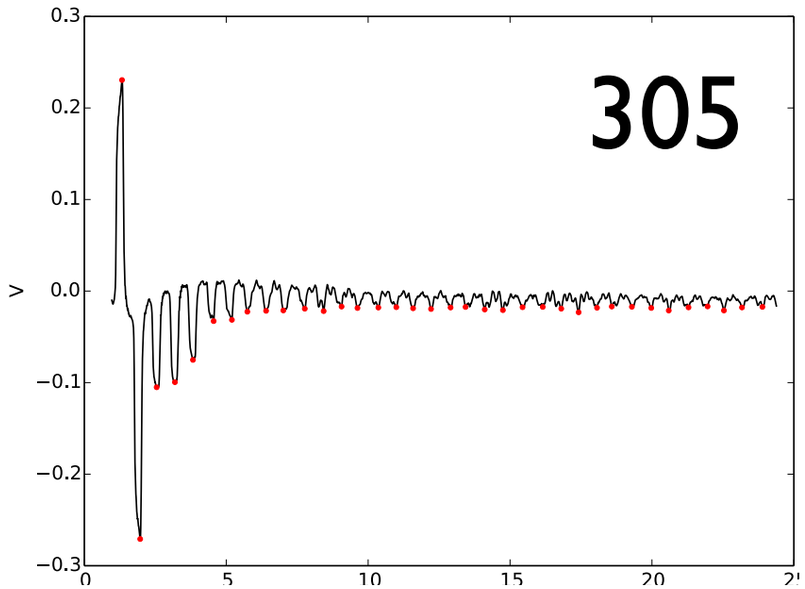
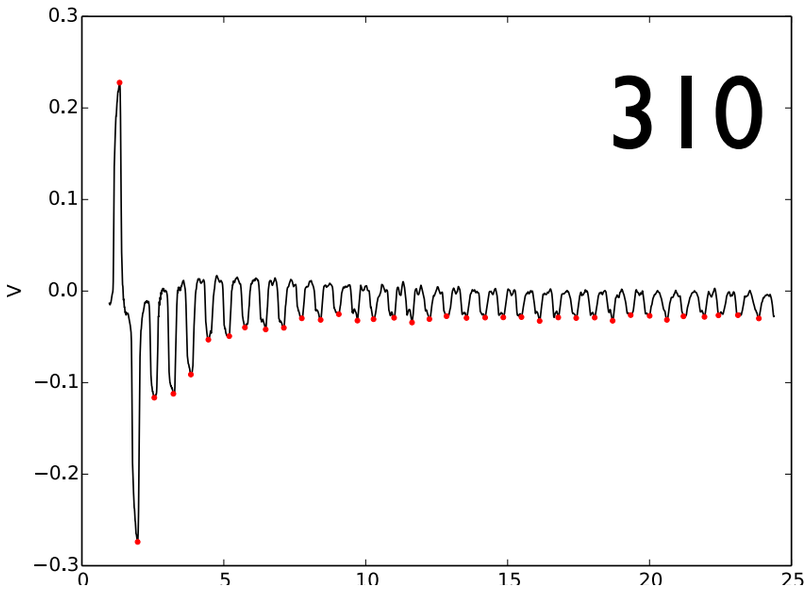
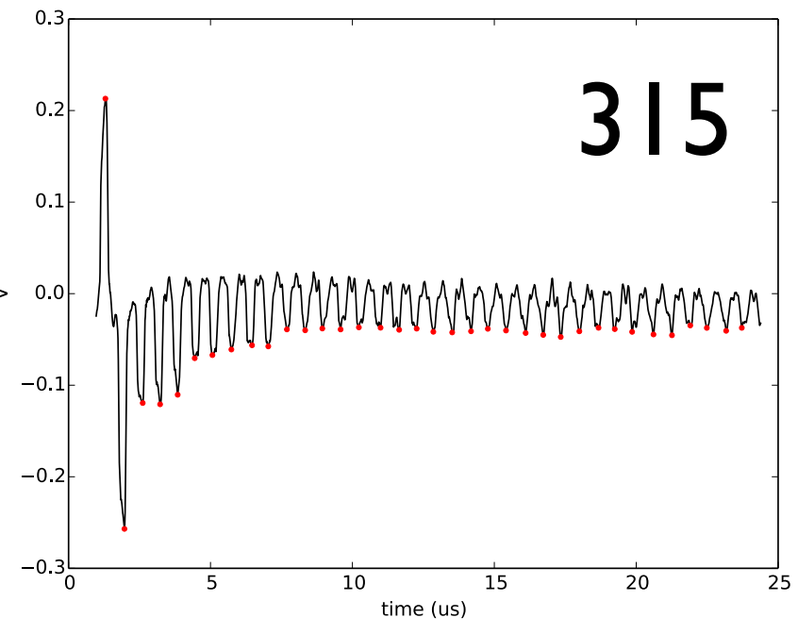
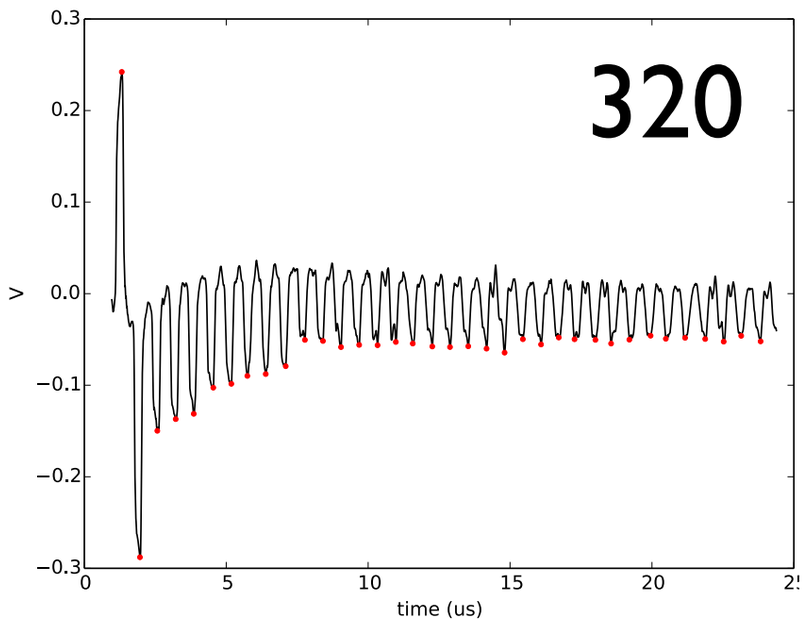
F5 (NEZU)

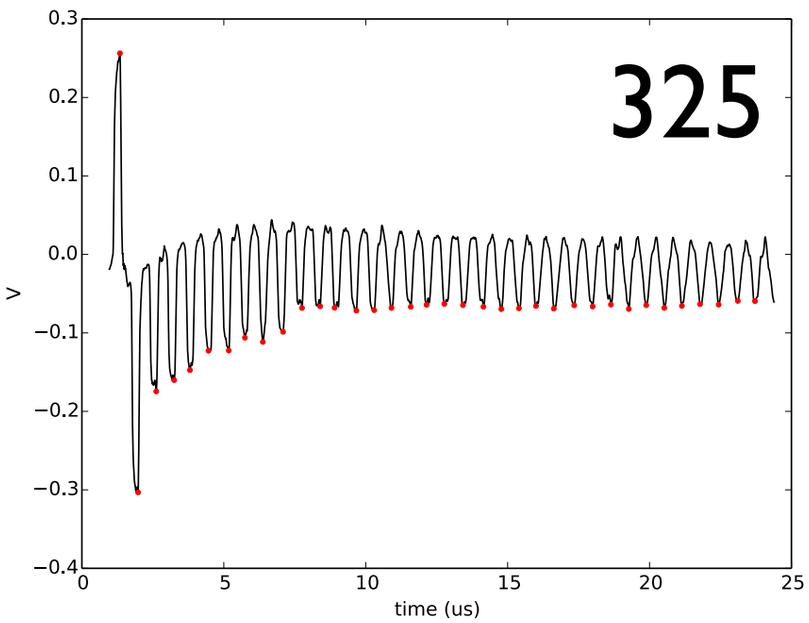












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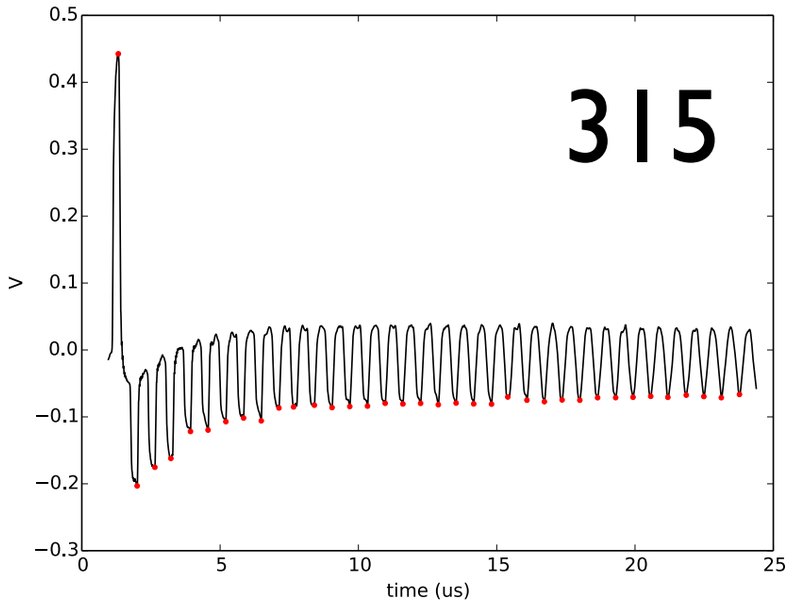
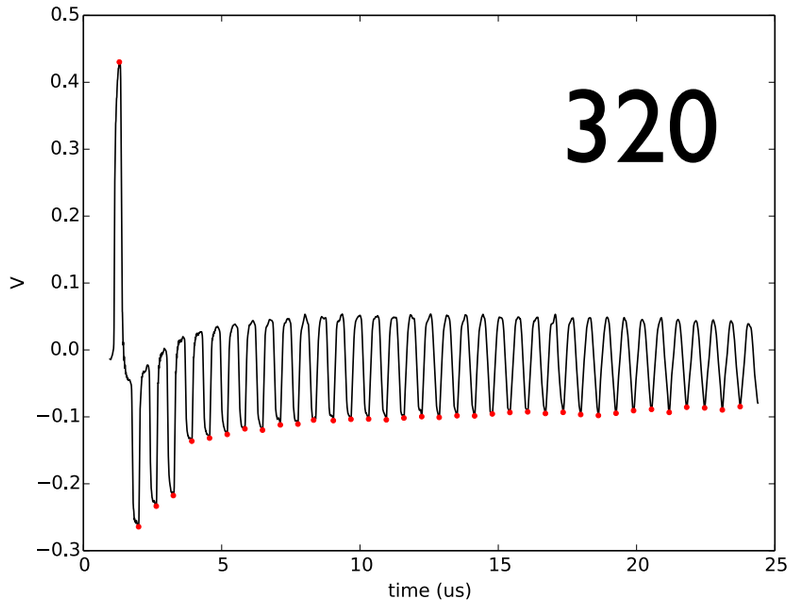
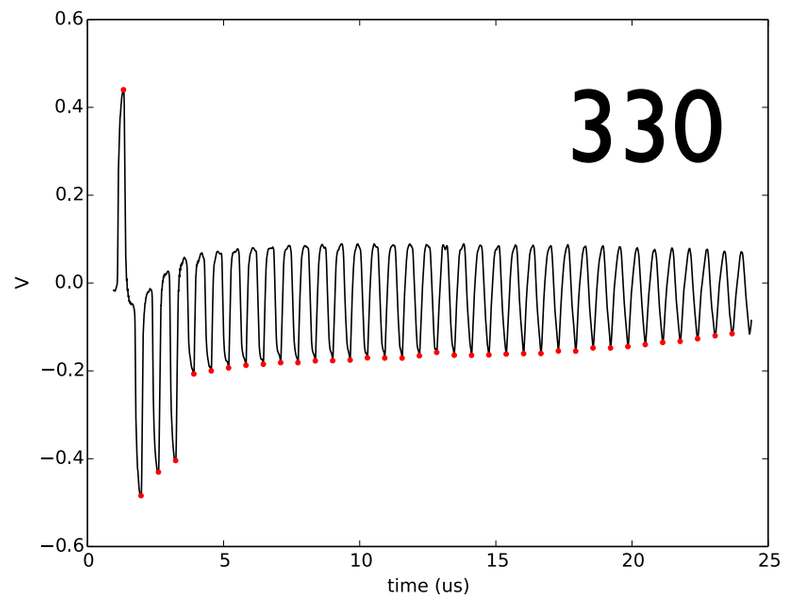
FI (TAZU)







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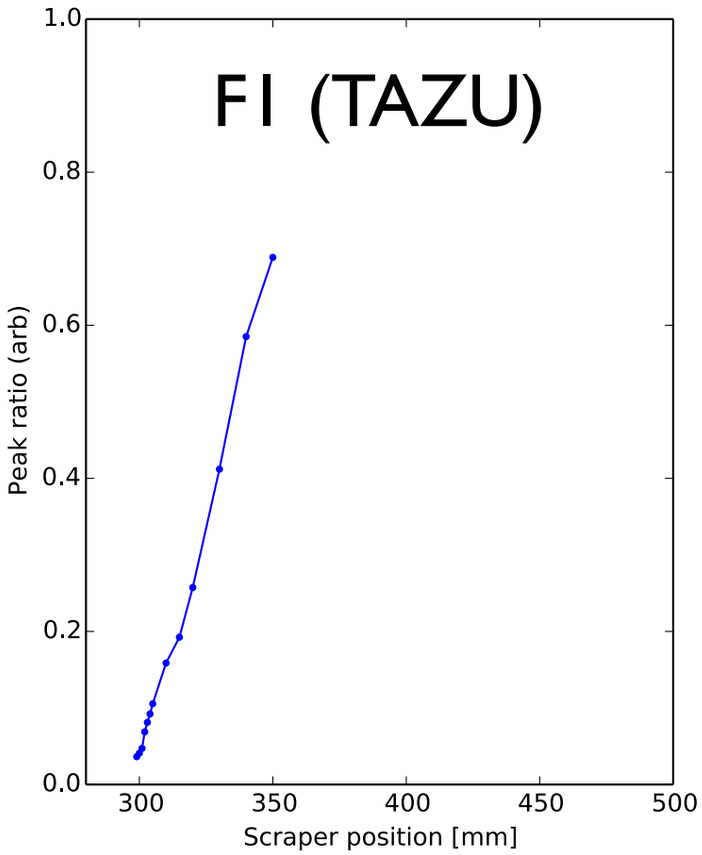
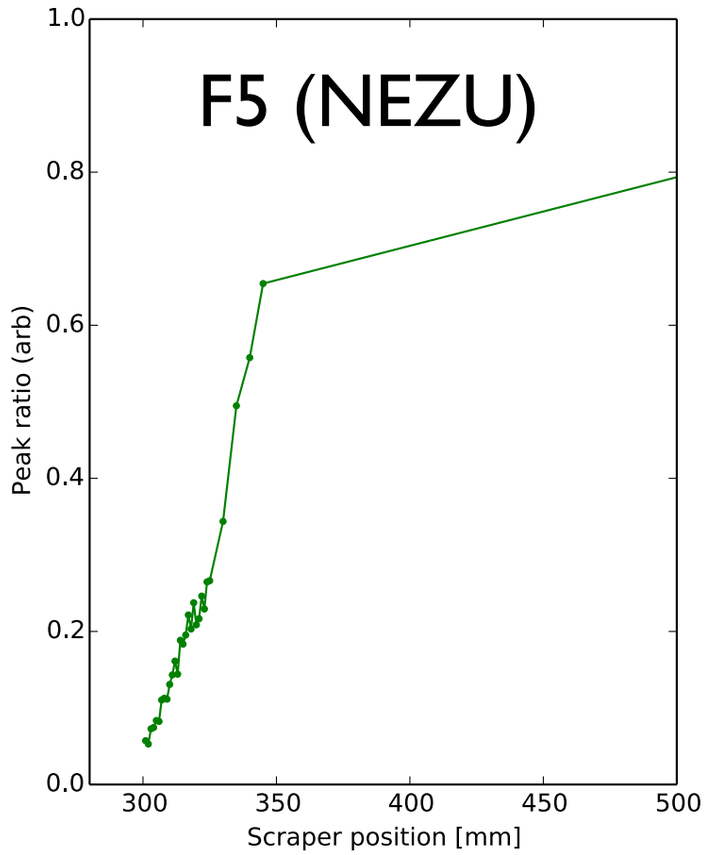
COD data from 6/11/13

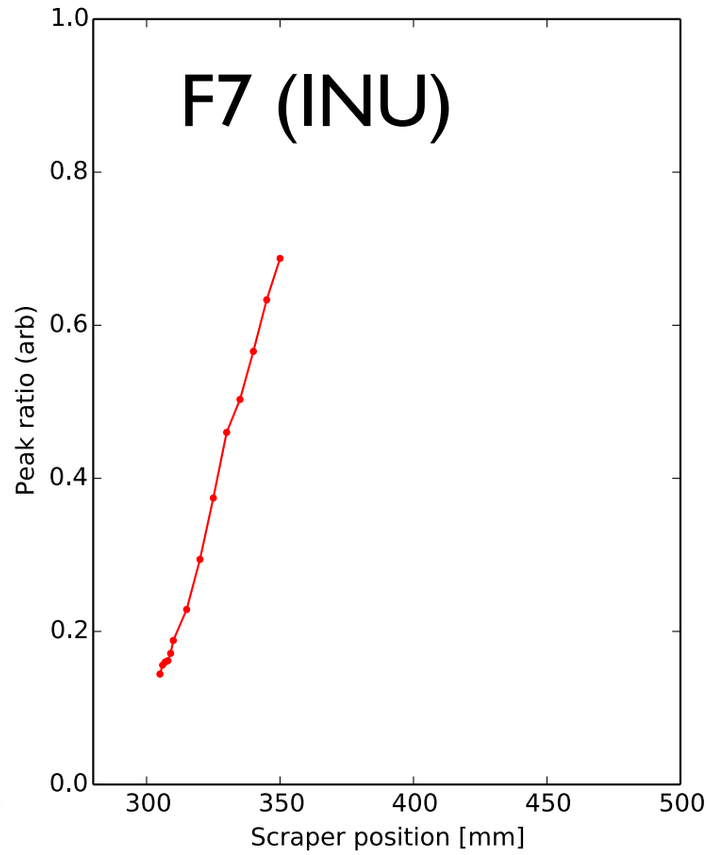
Analysed using David's peak finding algorithm

Take ratio of 10th to 0th peak

Hard to tell where the CO is…







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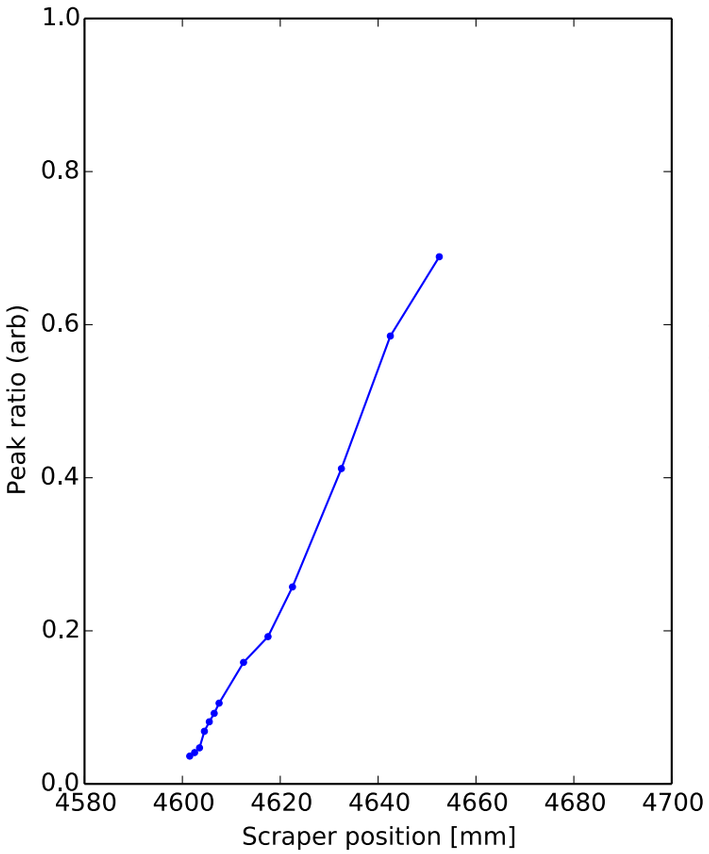
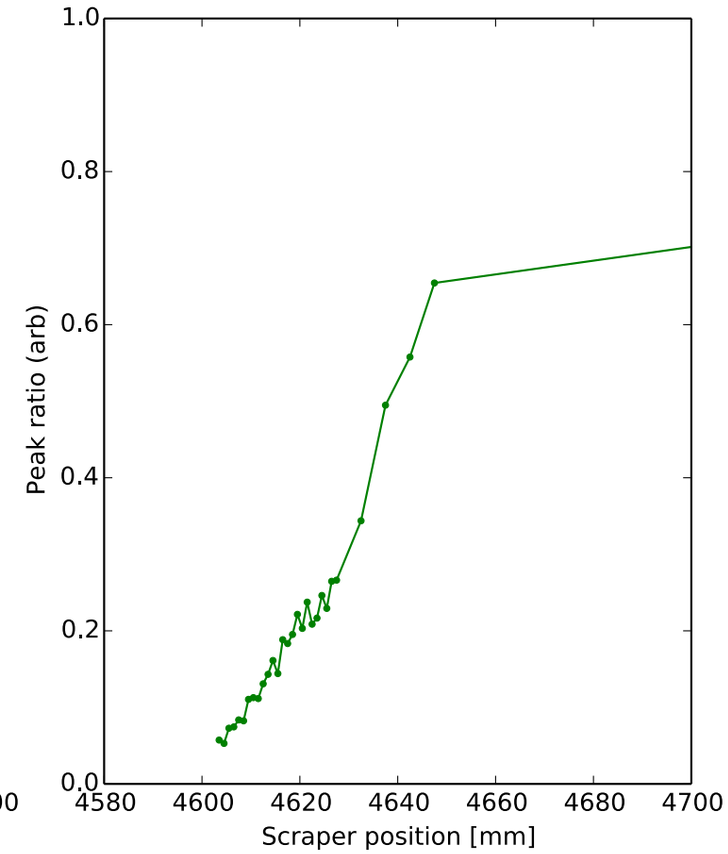
Corrected for actual radius

F1 (TAZU)



F5 (NEZU)



F7 (INU)