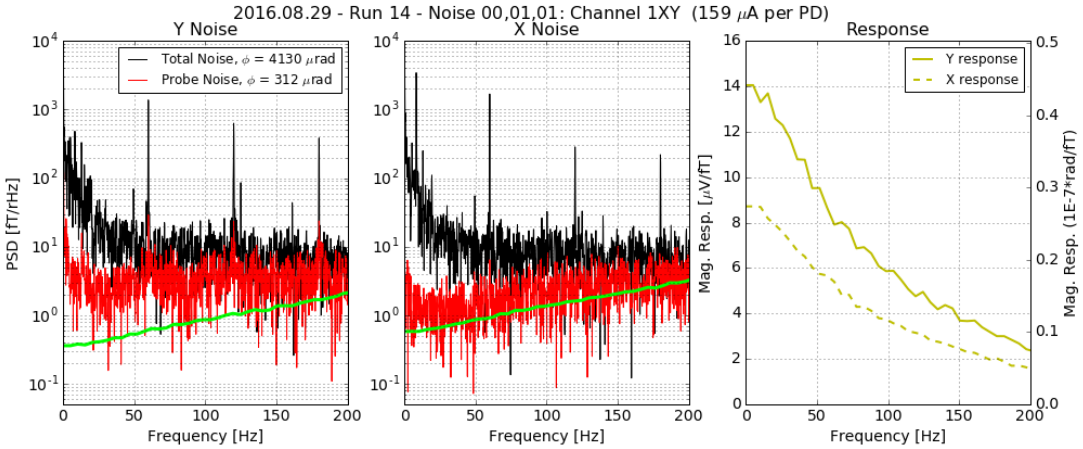
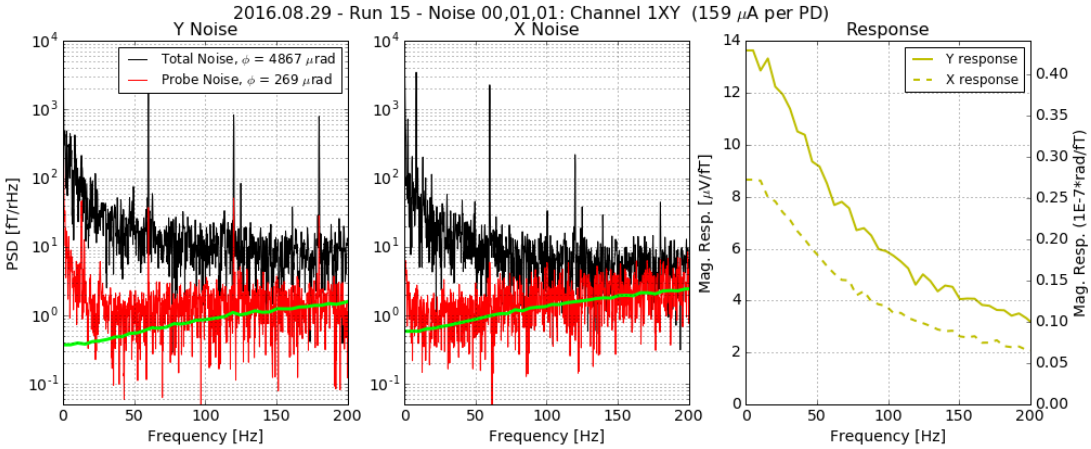
8/29: For 2 kHz z-mode, look at the difference in noise between using the “default” 250 Hz filter and a 500 Hz 4-pole Butterworth low pass filter.

250 Hz



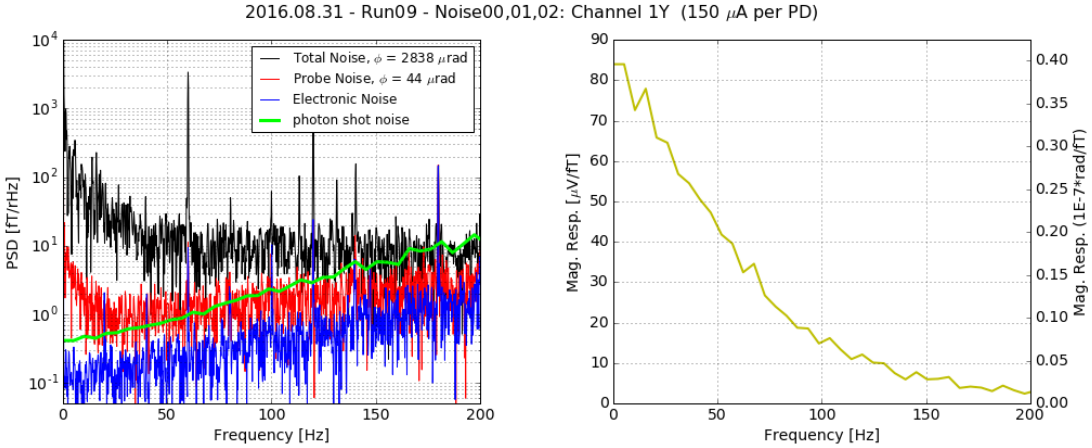
500 Hz



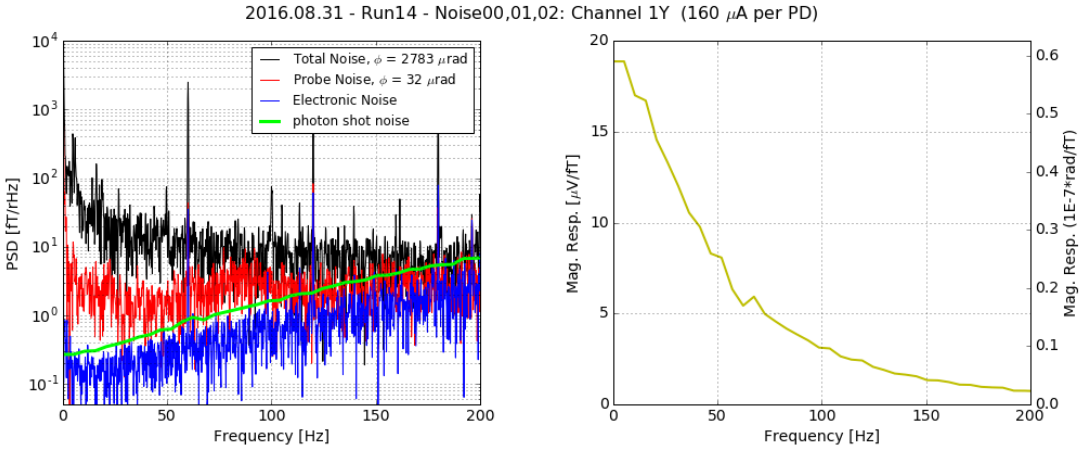
Notice the significant difference between the technical Y noise. The digitization was much more noticeable with the 250 Hz filter – the two must be related.

8/31 Instead try using only hardware to take the measurement. The X and Y measurements were taken sequentially, not simultaneously. The X measurement was done using the SRS SR830 lock-in amplifier with a 1 ms time constant (f=159 Hz). The Y measurement was done by taking the data from the output of the SRS I-V converter with a 2-pole lowpass filter on at 100 Hz.

X data:



Y data:



The probe noise on the Y measurement is noticeably lower than the observed probe noise on the Y when the labview 4 pole filter is applied. So our “true” technical noise floor is lower than what we’re being led to believe it is by the LabVIEW-filtered data. **The “total” magnetic noise actually looks pretty similar though…so does it matter??**

Other notes:

A single 2-pole Butterworth filter does indeed reduce this “digitization” crap that we see but the baseline noise ends up being significantly higher. Some amount of the 1 kHz “fuzz” also leaks into the calibration signal.