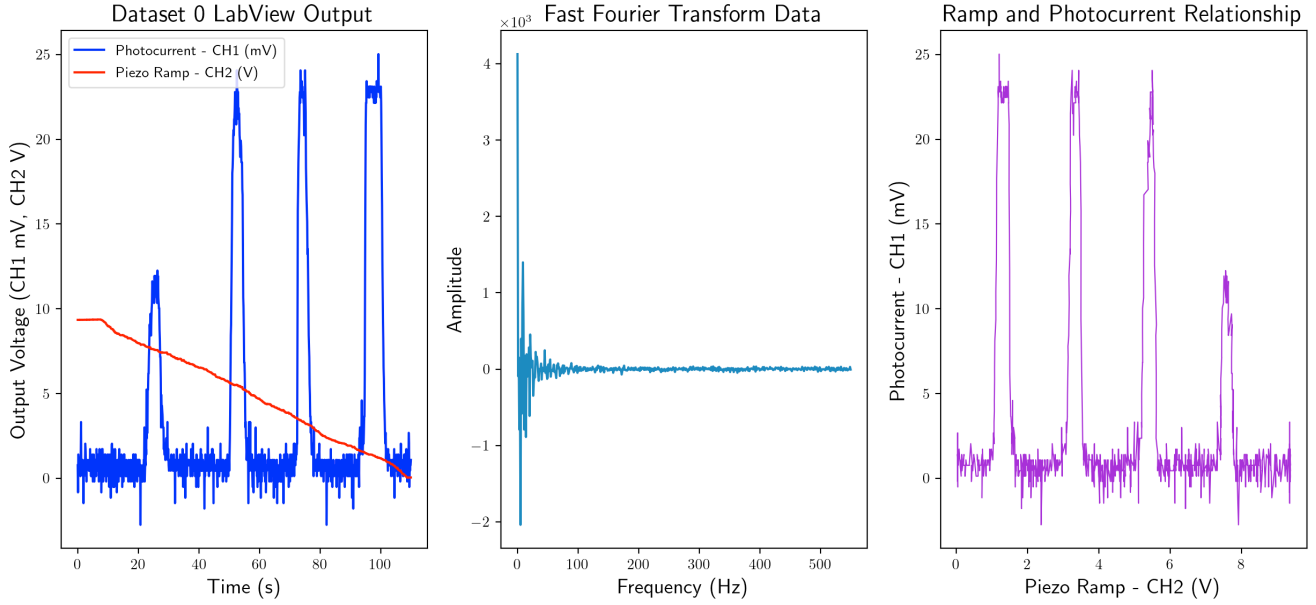
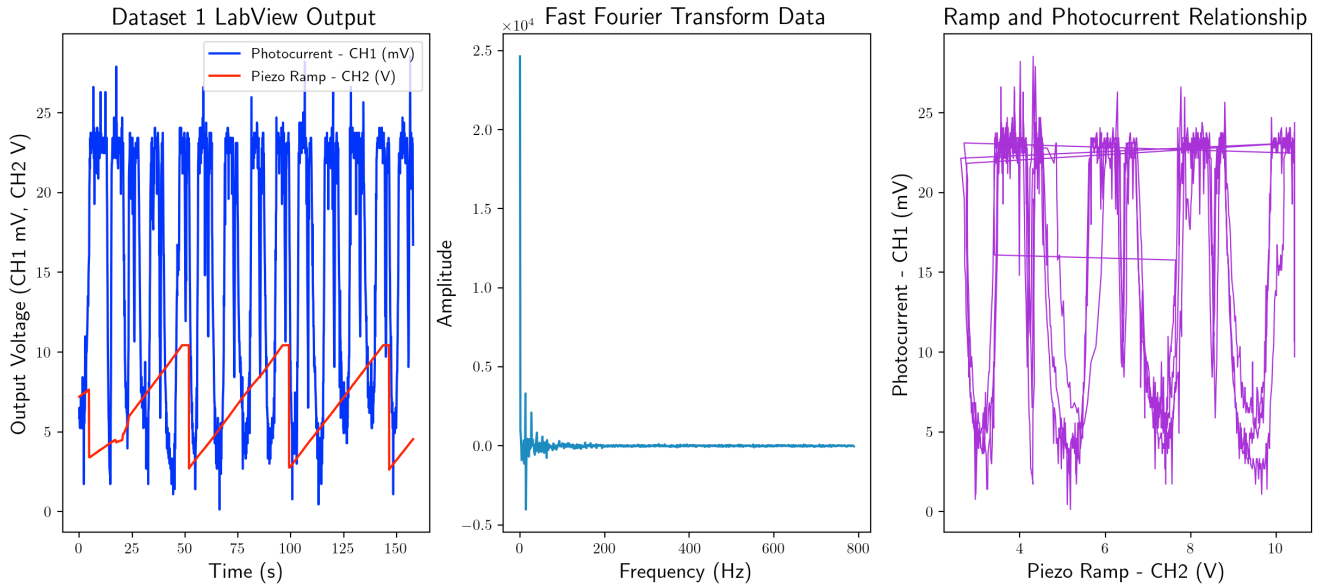


Brillouin Scattering - Data Plotting, Bibliography

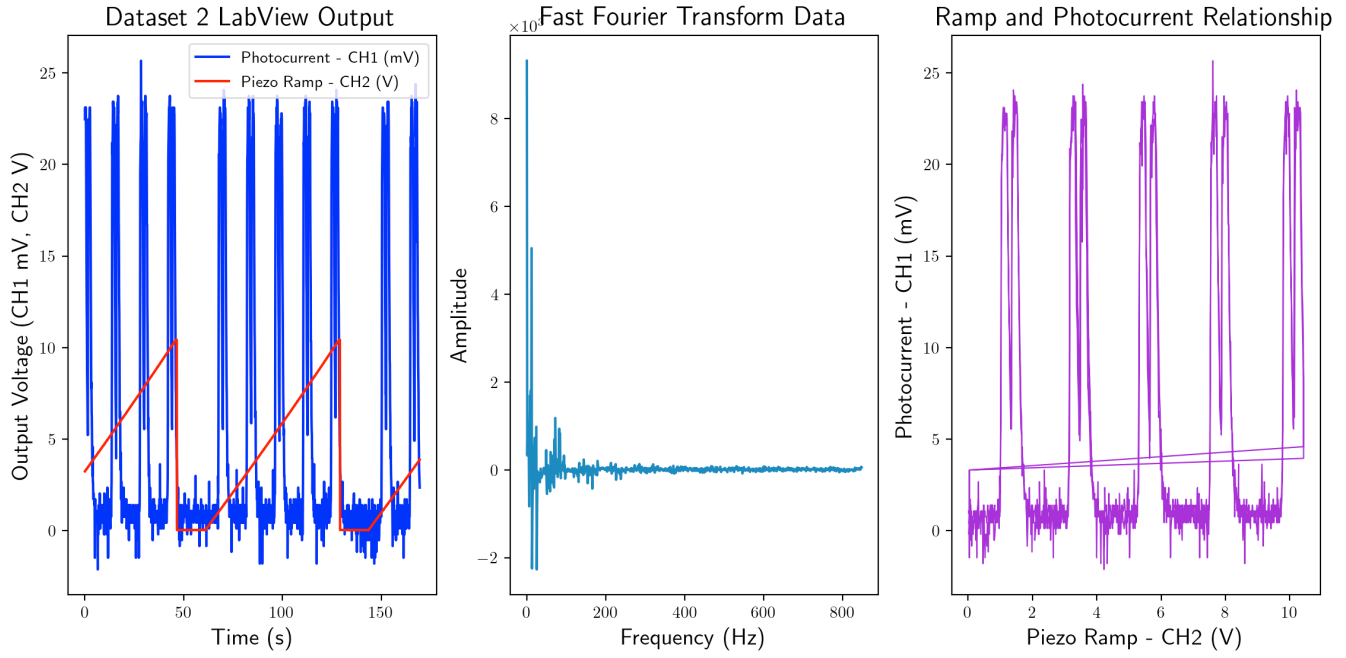
Jace Alloway; PHY424 Experiment 3



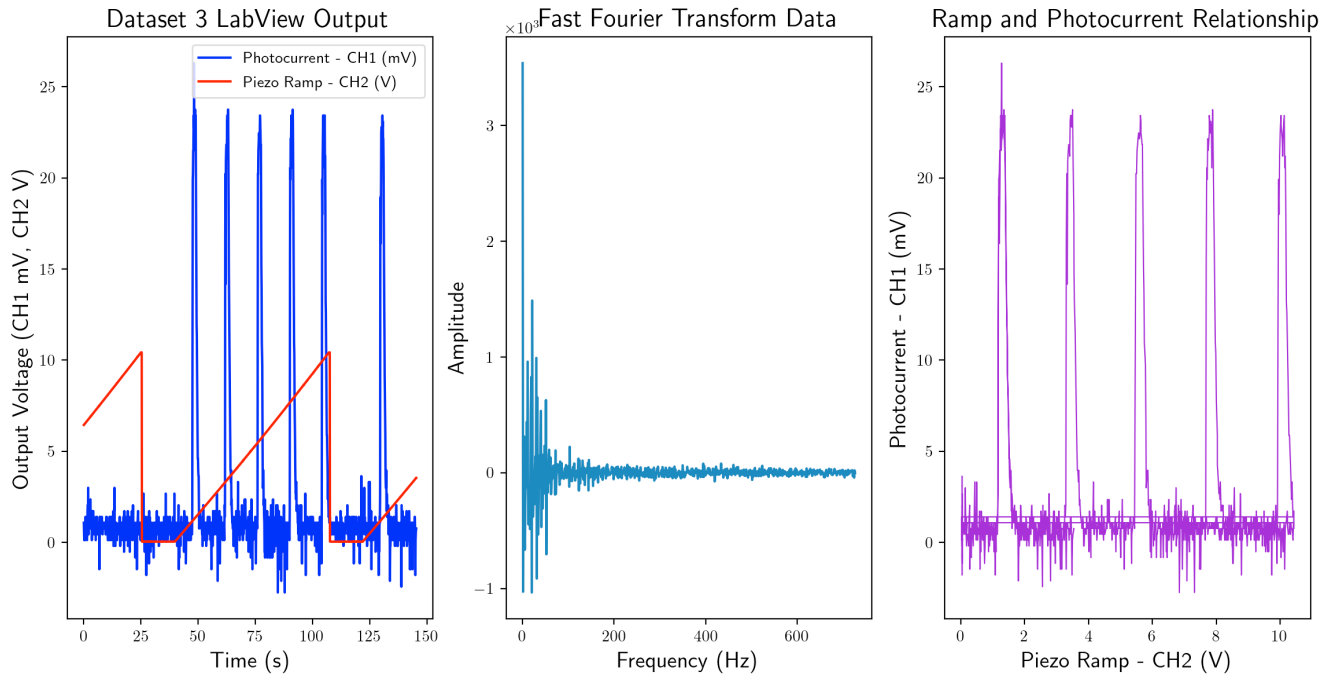
Dataset 0 acquired from Labview using frosted glass at 45 degrees, 1500V. Initially, ramp adjustments were not working and were done manually. The leftmost figure contains the data acquired directly from LabView and the photomultiplier tube (PMT), the blue curve outlining the PMT output in mV, and the red curve the manual ramp adjustment, in V. Each were measured as a function of time, although CH1 is a function of CH2 directly as the piezo governs the fine mirror separation. The center figure illustrates the frequency distribution of any acquired signal from the PMT, most of which is zero. The rightmost figure plots the direct relationship between the PMT current output and the mirror adjustment from the piezoelectric actuator.



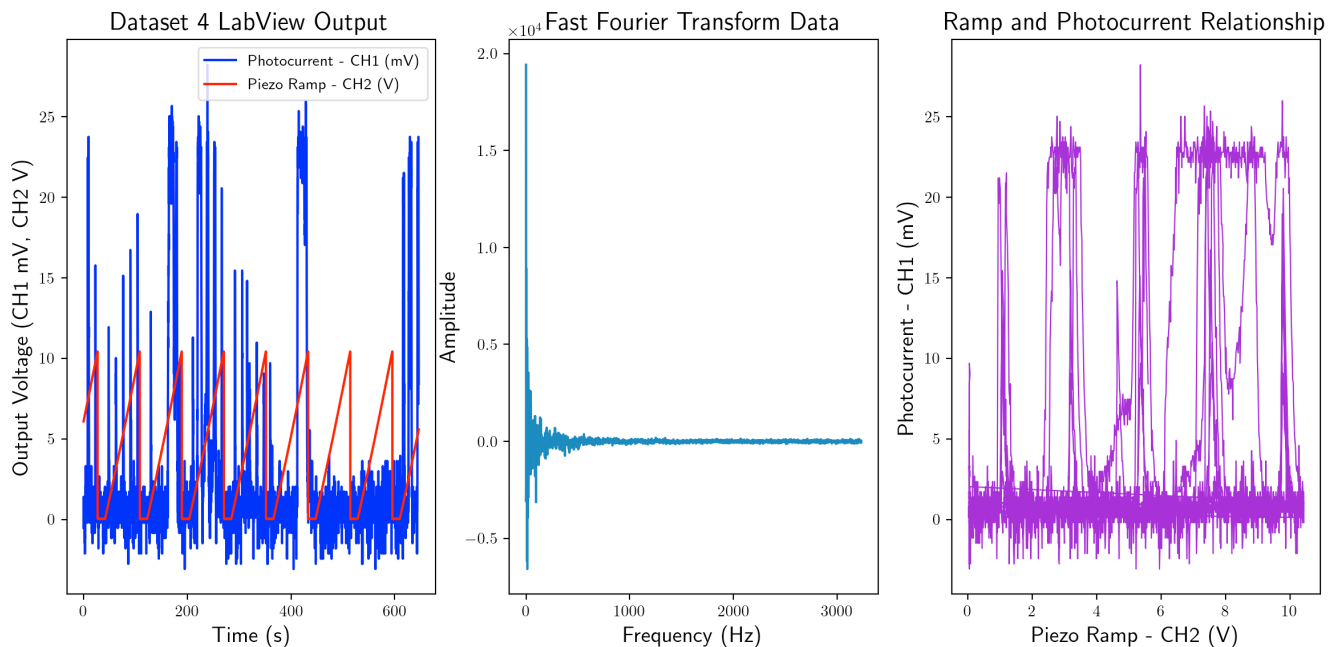
Dataset 1 acquired from Labview using frosted glass at 45 degrees, 1500V. Ramp adjustments are now automatic, set at a $0.5s * 100x$ time constant multiplication. The leftmost figure contains the data acquired directly from LabView as previously described. The center figure illustrates the frequency distribution of any acquired signal from the PMT. The rightmost figure plots the direct relationship between the PMT current output and the mirror adjustment from the piezoelectric actuator.



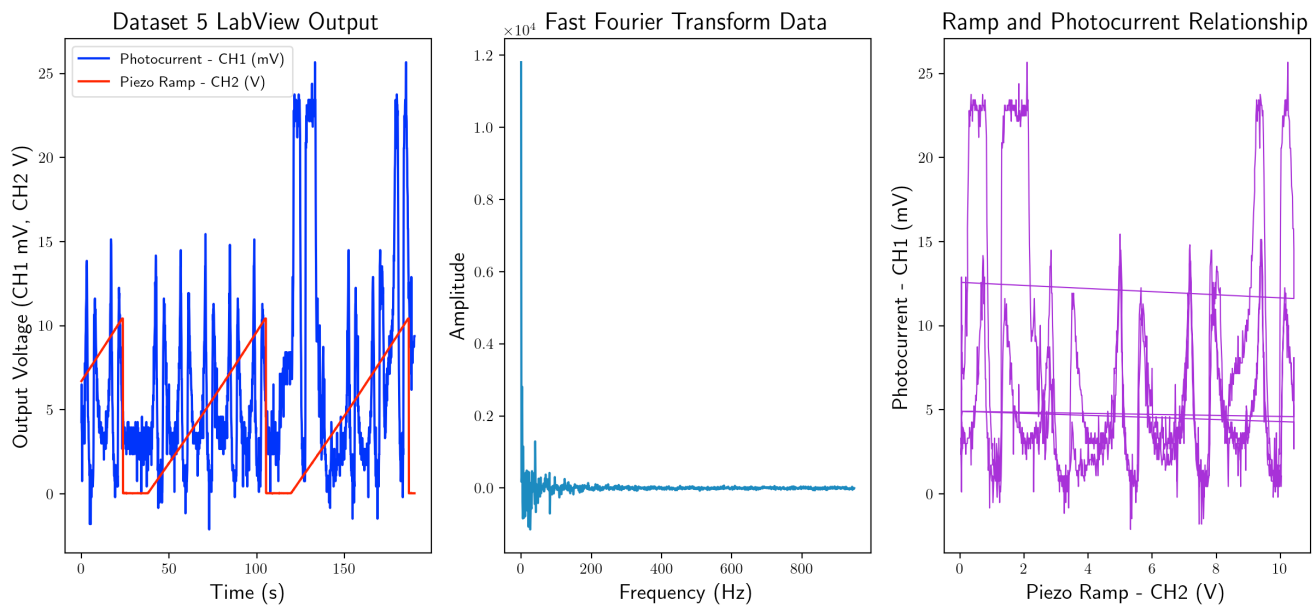
Dataset 2 acquired from Labview using frosted glass at 45 degrees, 1500V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described.



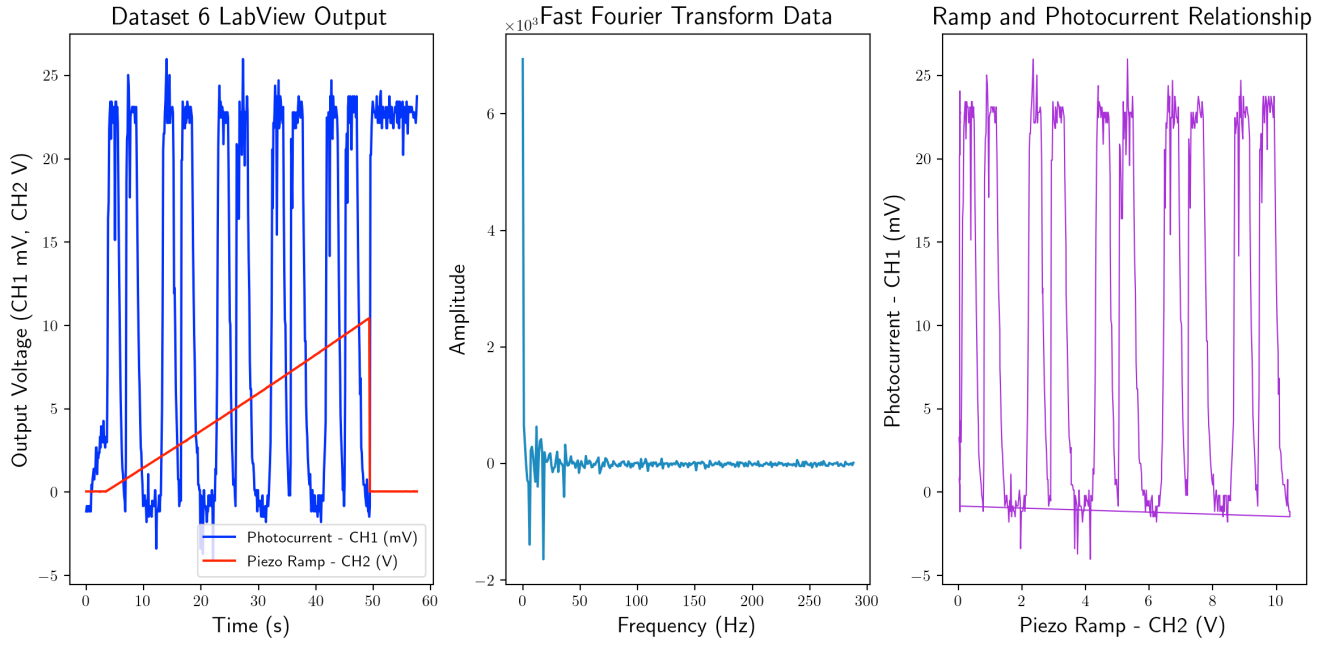
Dataset 3 acquired from Labview using frosted glass at 50 degrees, 1500V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described. Peaks are exact instead of two-pulse, and this was due to a slight adjustment of the frosted glass orientation to 50 degrees.



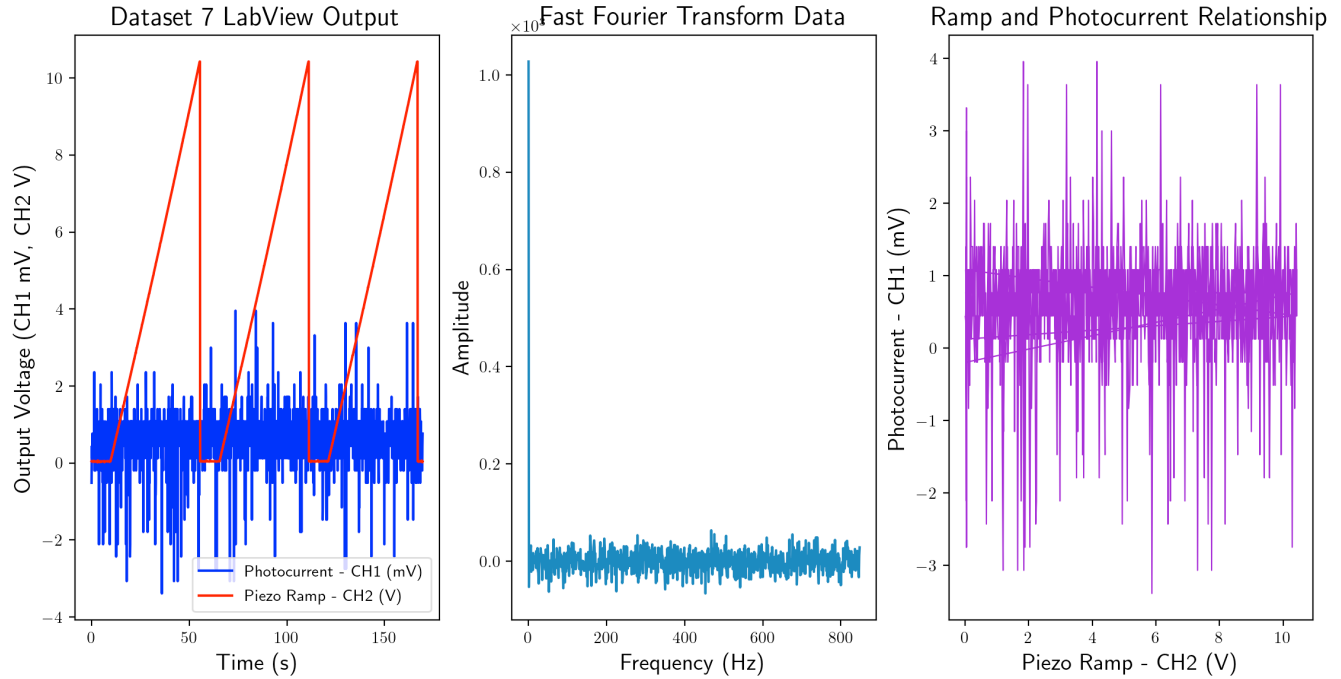
Dataset 4 acquired from Labview using frosted glass at 45 degrees, 1500V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described. No trend can be seen as electronic adjustments were made to attempt to reduce noise. Large spikes are due to gain adjustments on the amplifier. Silences in periodicity are due to E, ΔE changes on the analyzer, with the DDL setting changed to SDL on the amplifier around the 420s mark. Obviously, all attempts made to reduce noise were unsuccessful.



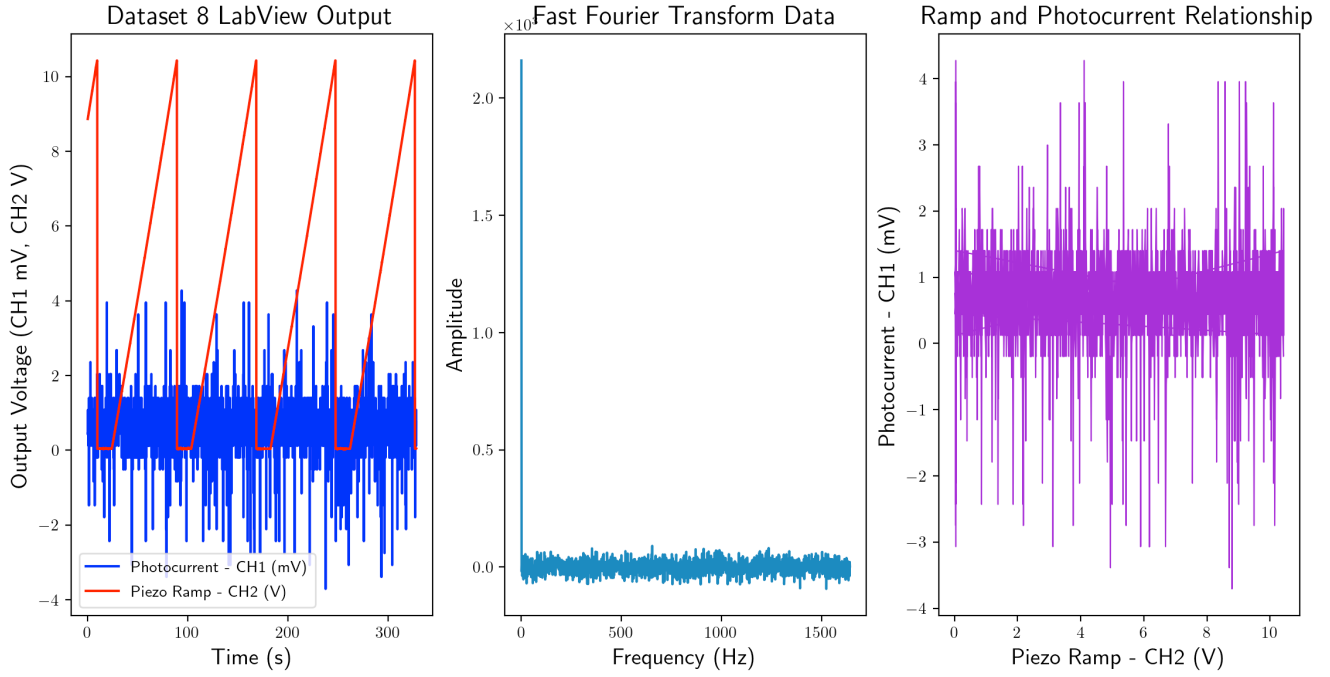
Dataset 5 acquired from Labview using frosted glass at 40 degrees, 1700V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described. Similarly, electronic adjustments were made in this dataset to attempt to reduce noise. The large spikes at 130s are due to gain adjustments. The increase in chaos past the 100s timestamp is due to counts-per-second increases on the ratemeter to attempt to reduce frequency bandwidth of noise. Obviously, all attempts made to reduce noise were unsuccessful.



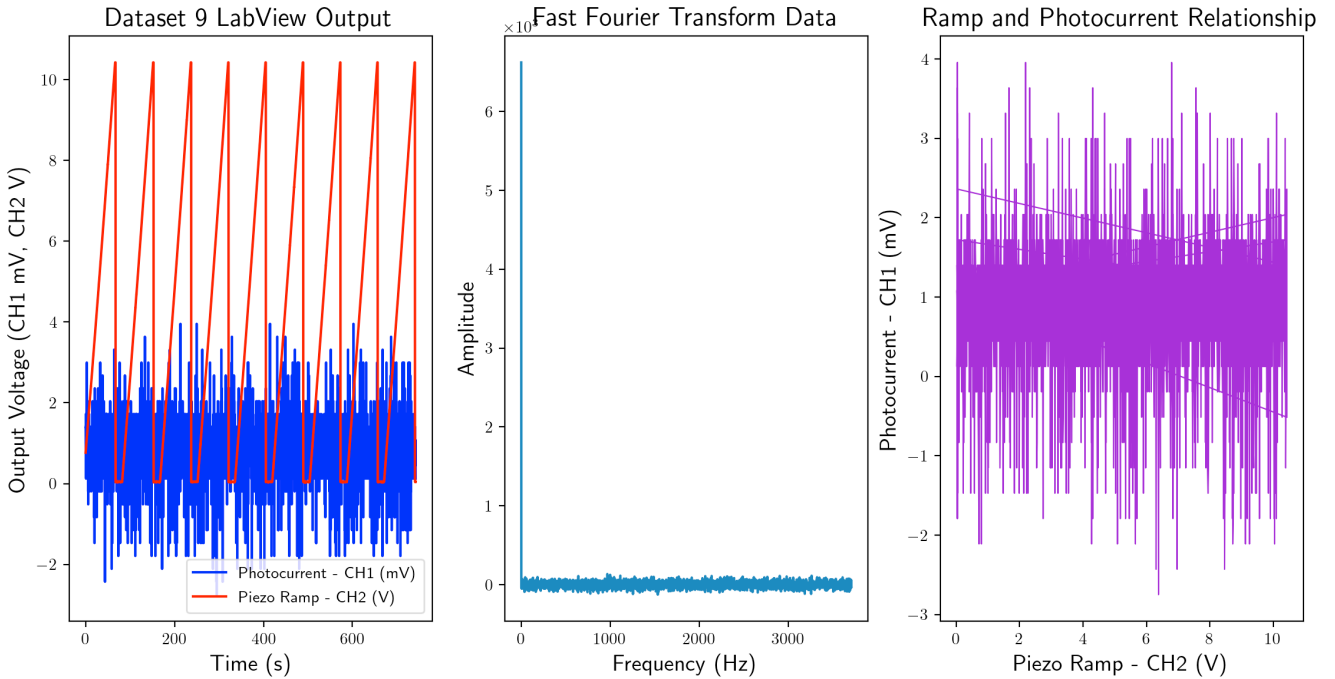
Dataset 6 acquired from Labview using frosted glass at 45 degrees, 1500V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described. This trial was taken for one period after re-aligning the apparatus to attempt to acquire a signal with increased noise-to-signal ratio. Tape overlining the laser output was removed from hereon. Compared to the voltages from other trials, it can be observed that the detector is clearly oversaturated and noise is not reduced.



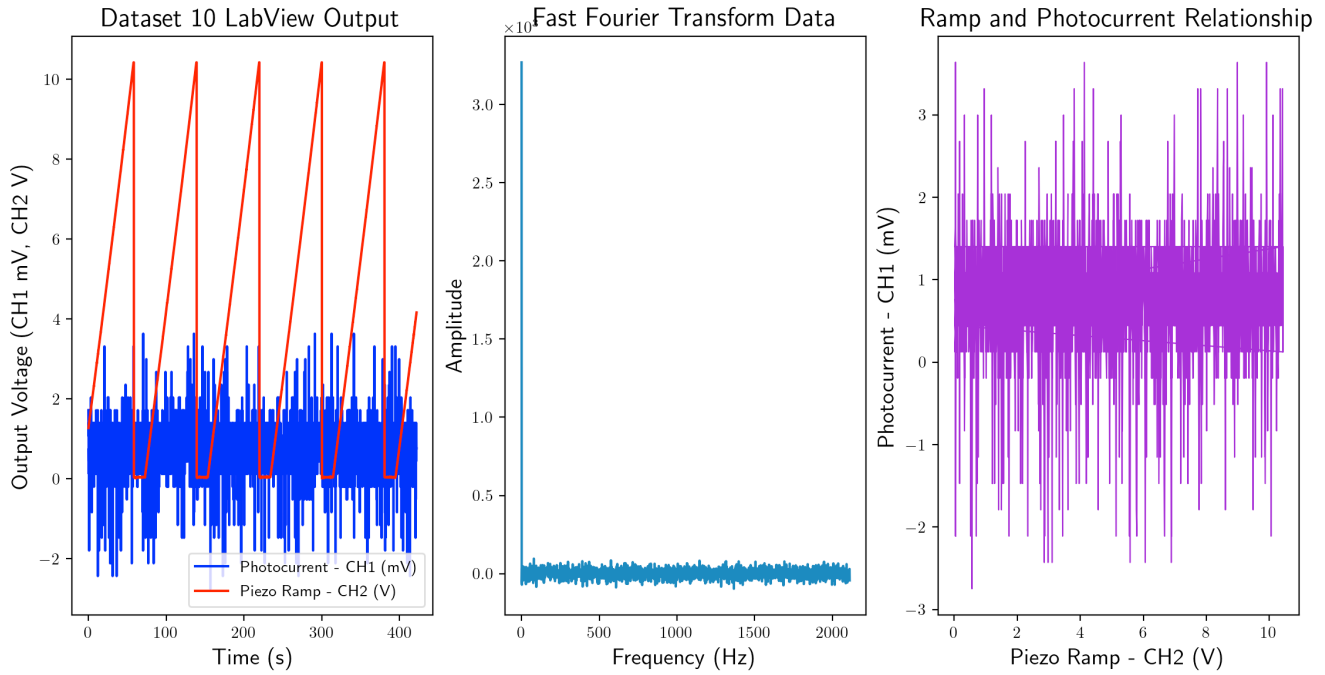
Dataset 7 acquired from Labview using Carbon Tetrachloride at a 90 ± 1 degree scattering angle, 1500V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described. Clearly, there is no relationship and no periodicity in the data between CH1 and CH2. Only noise is observed, as can be seen from all figures.



Dataset 8 acquired from Labview using Carbon Tetrachloride at a 90 ± 1 degree scattering angle, after re-aligning the sample and widening the shutter pinhole, 1500V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described. Similarly, only noise can be observed.



Dataset 9 acquired from Labview using Carbon Tetrachloride at a 90 ± 1 degree scattering angle, after re-aligning the sample and widening the shutter pinhole a second time, 1800V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described. Similarly, only noise can be observed. Throughout this trial, gain adjustments were made and voltage was increased to 1800V to attempt to increase signal output.



Dataset 10 acquired from Labview using Methyl Acetate at a 90 ± 1 degree scattering angle, 1700V. Ramp adjustments are automatic $1s * 100x$ time constant multiplication. Figures are as previously described. Similarly, only noise can be observed.

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