Data Summary
3/10/2015

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This is a repeat of the measured power (with the photodiode on the oscilloscope) versus the laser current setting. Compared to the original, this one used 512-measurements averaged on the scope. The higher rep rate used here was 500kHz, although I’m thinking of changing my high rep rate (used to measure leakage current) to 731.57kHz to avoid using an even number.
This is my measurement of where the photodiode voltage curves cross for two different repetition rates, 731.57kHz, which makes a measurable leakage current, and 18.5855Hz, which we want to use to take data. The laser current setting has 0.1mA increments, so 36.5mA is the closest to the crossover point I can get, at which point they are nearly equal, by the fits.
I ran into something unexpected today. The top chart is a measurement I made with David’s guidance at the end of 2012 that measured the voltage across the resistor in the box (that has the bias supply return current going through it), versus the applied bias voltage. The slope of this curve gave us a conversion from mV read across that resistor to nA of current through it, once the resistance of the meter was taken into account.

The bottom chart is the exact same measurement made this morning. Now, we have had hardware changes of the boards/cables down by the detector, but anything that would make us expect this radical a change? If my conversion factor is now not linear I can handle that, but it’s far less convenient, and I feel needs to be explained. I’ll repeat this measurement tomorrow morning to see if I can find a mistake.
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