Popping Corn
An Example of the Poisson Distribution?

Not when using an ordinary popper.

1, Usually only about 100 kernels are popped. For the P. Distribution to apply, the mean must be ~ constant. This means the number popped during the popping must be much less   than the number of kernels available to pop.

2, The probability that any kernel will pop must be approximately constant. Unless the kernels are added to an already hot popper and the first few are discarded, this will not be true.

In addition to the above the detection must ensure the pops recorded are independent, and if some are not detected, at the minimum, these should not bias the data.

The following images show the evolution of my attempt to fulfill the above requirements.

My first popper, a very good steel antique popper, for tasty uncharred enjoyment.
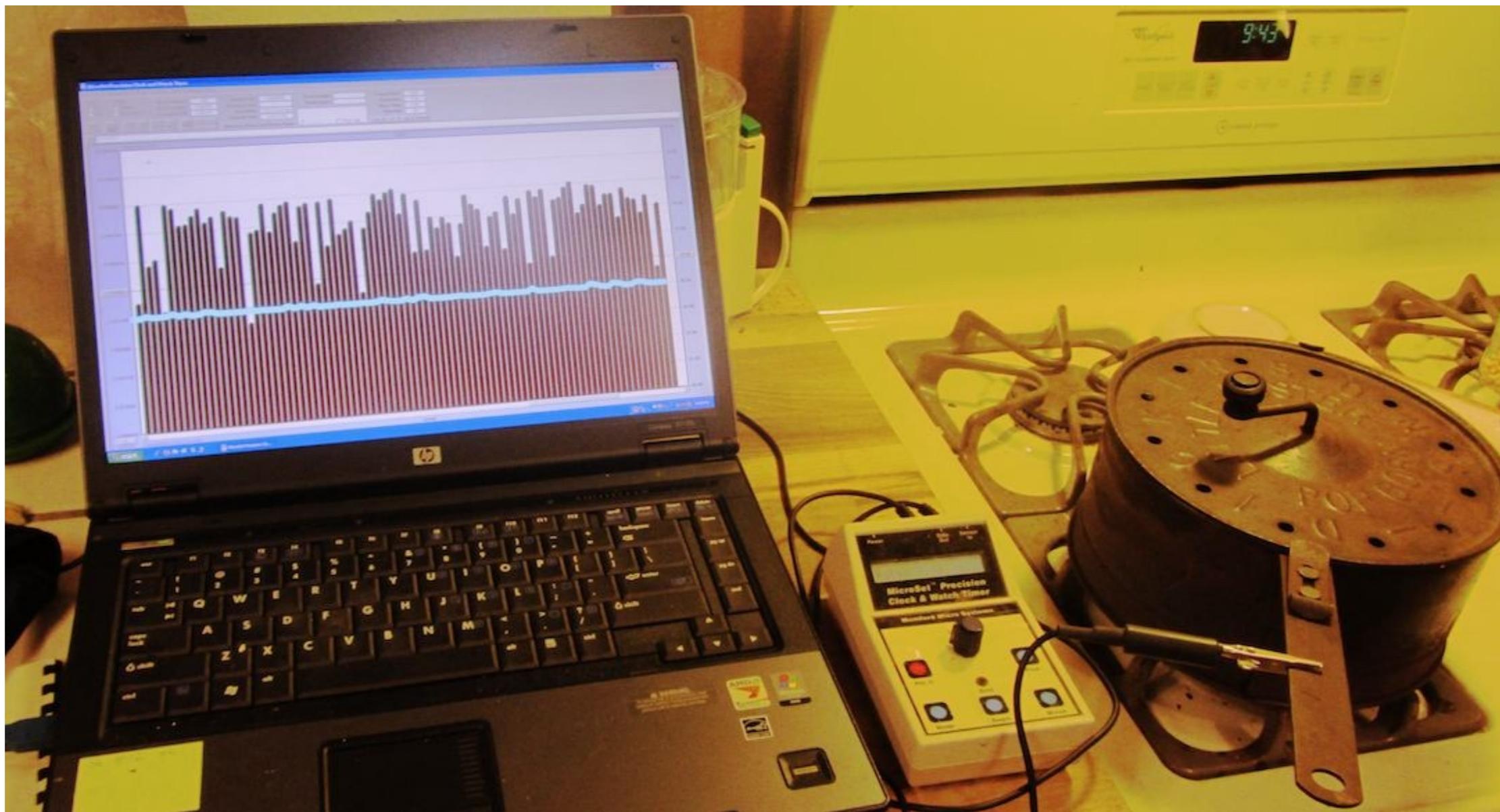
The acoustic detector clipped to the lid-stirrer handle, and the MicroSet clock timer outputted to an IBM platform "lap top" computer. Of course no stirring, as I didn't have a filter to just detect pops without the scraping. The result: charred popcorn. Still the data showed an exponential interval distribution. Of course! The system detected the initial pop and the corn hitting the lid. Not independent! And a bias towards short intervals.

Well ... At least I enjoyed the upper layer.
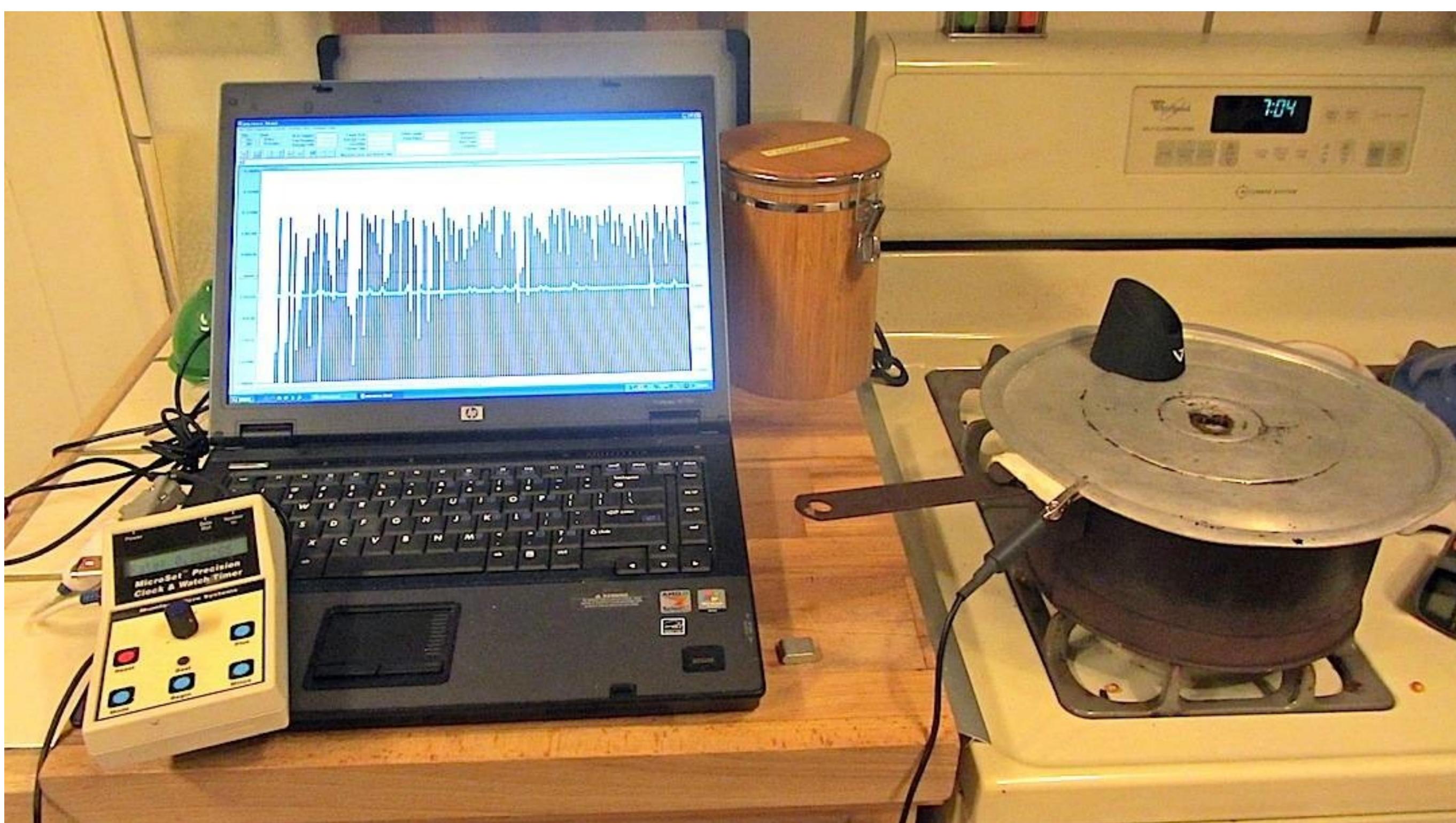
That problem solved here. The lid is acoustically insulted, and most of the popped reach the lid, as verified by counting the kernels before and the number detected after popping. *N.B.* The display shows the mean is not constant!
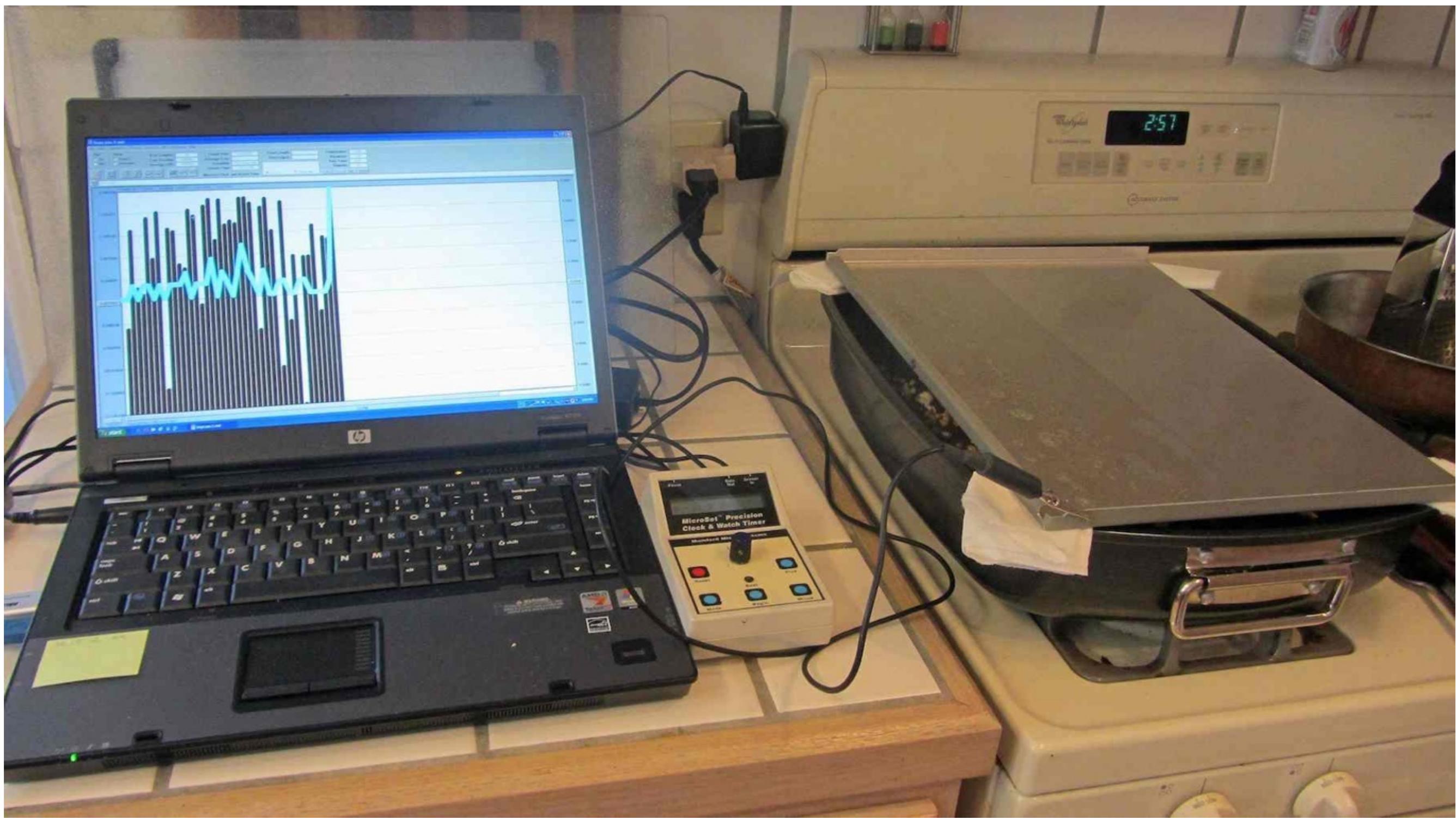
Here I've attempted to record a small proportion of the total available (greater than 300) by using a "large popper". Unfortunately, the temperature was very non-uniform violating the constant mean requirement. I considered obtaining a thick aluminium sheet, but instead .....

Tried the dutch Oven.

By the way, note the lid, an HP case aluminium sheet is elastomer coated, which damps what would be a rather high Q ringing.

The Dutch Oven collecting data.

Note the paper towel acoustic isolator.

That's all folks -- Perhaps I'll continue and post result(s) and analysis in: http://www.cleyet.org/Misc._Physics/

bc ran outa time.

Well, .. I've cheated; more time today.
Here's data extracted from the middle of the last trial using the Dutch Oven grouped 2.5s, each.

45=>105 <2e-5 blu 900

S-1 events (pops) vs time (rsum seconds)
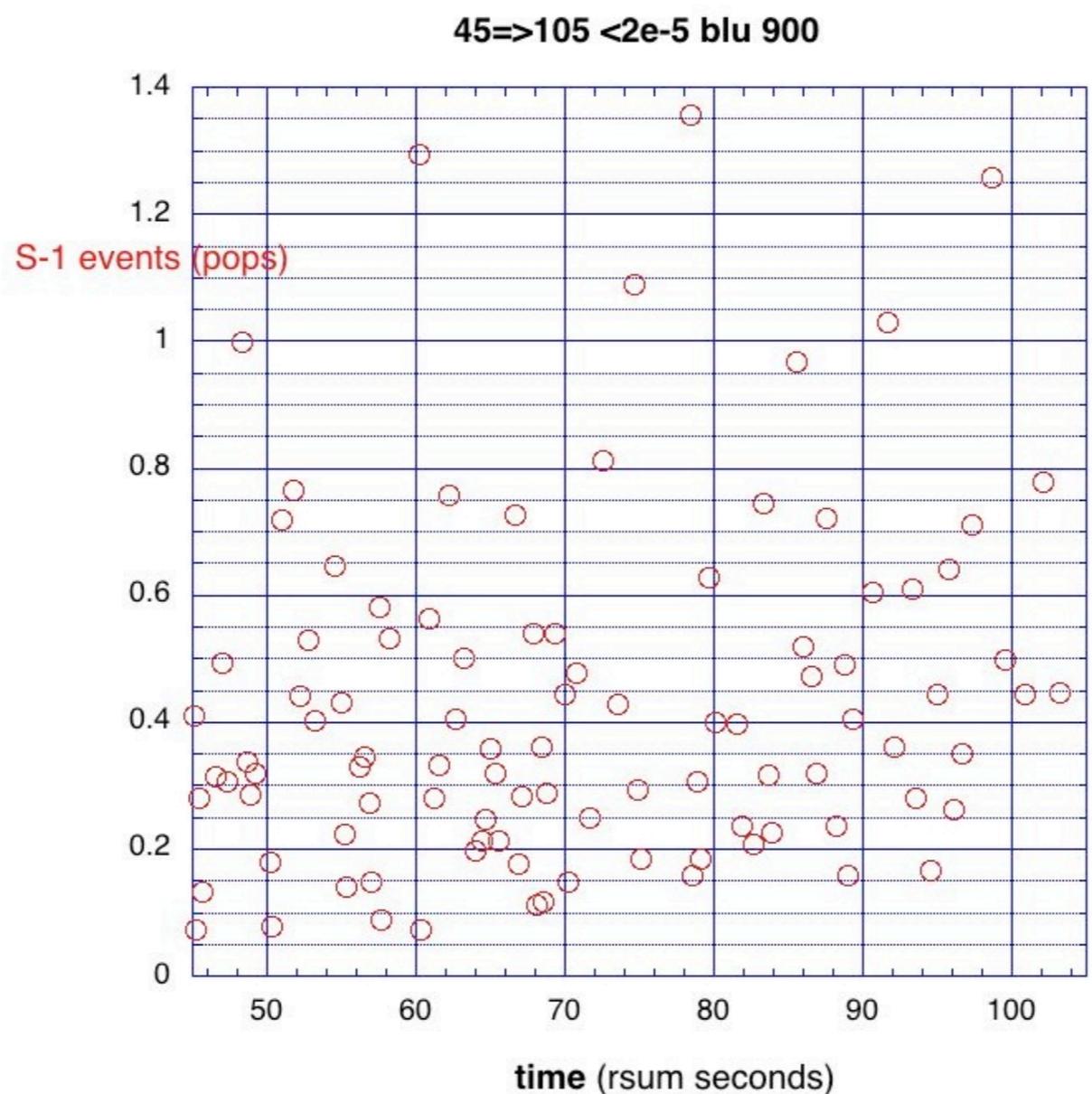
grouped 2.5s intervals	# in	expected #	Chi square
0=>2	4	7.6867	1.7682
3	5	5.3366	0.0212
4	5	4.7648	0.0116
5	6	3.4034	1.9811
6+	5	3.8085	0.3728
			sum/3 (DOF)=1.38
			>24% OK

2.5s intervals
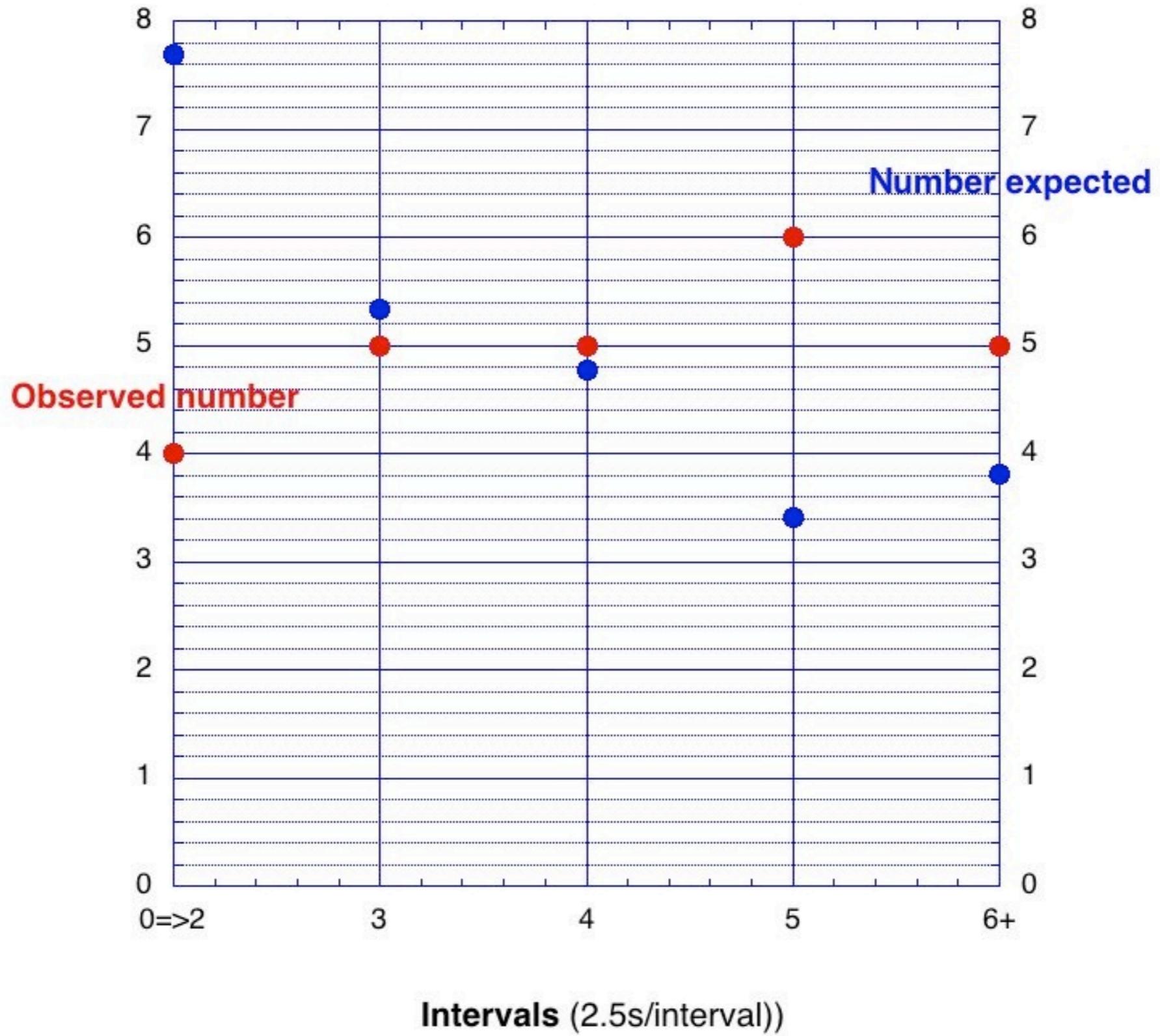
So.., Not all that good, as expected. The interval is even worse.