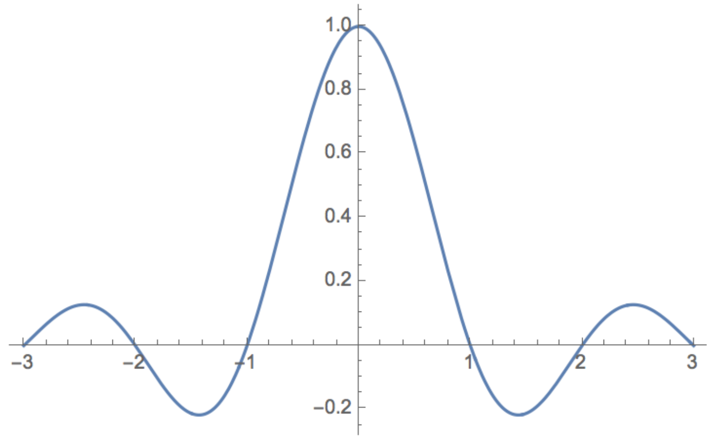
Now try for a fit function that will better scale with amplitude using the Sinc (wavelet) treatment. This yields stable fits for the amplitude (ie Npe) but the earlier method using normalized waveforms gives more stable fits for the phase, so I combine these methods.

In[145]:=
```
Plot[Sinc[Pi*x], {x, -3, 3}]
```

Out[145]=

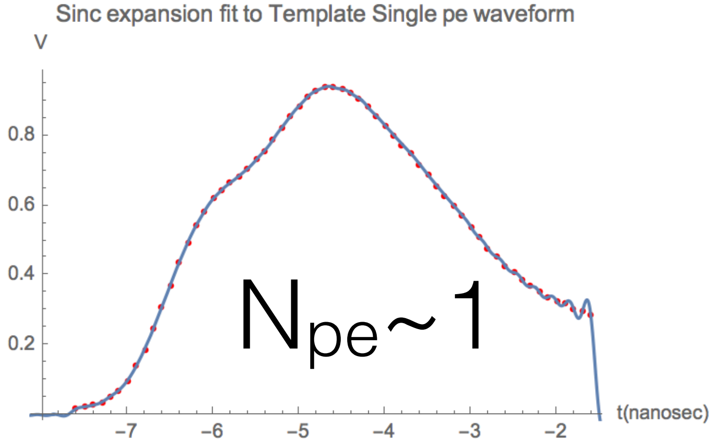


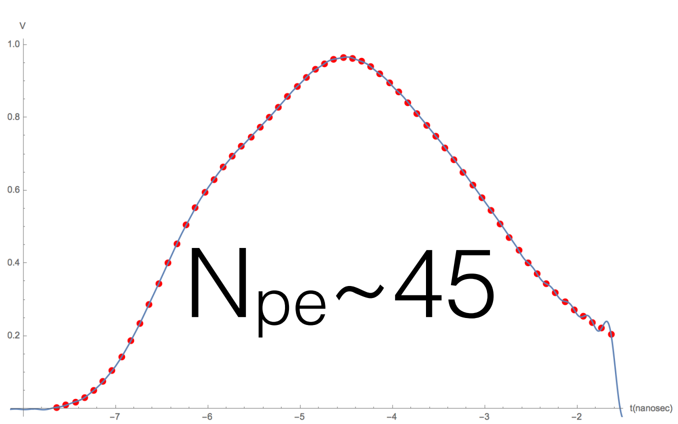
$$\text{avewave} = \frac{1}{2}\left(\text{v01}[[5]] + \text{v01}[[7]]\right);$$

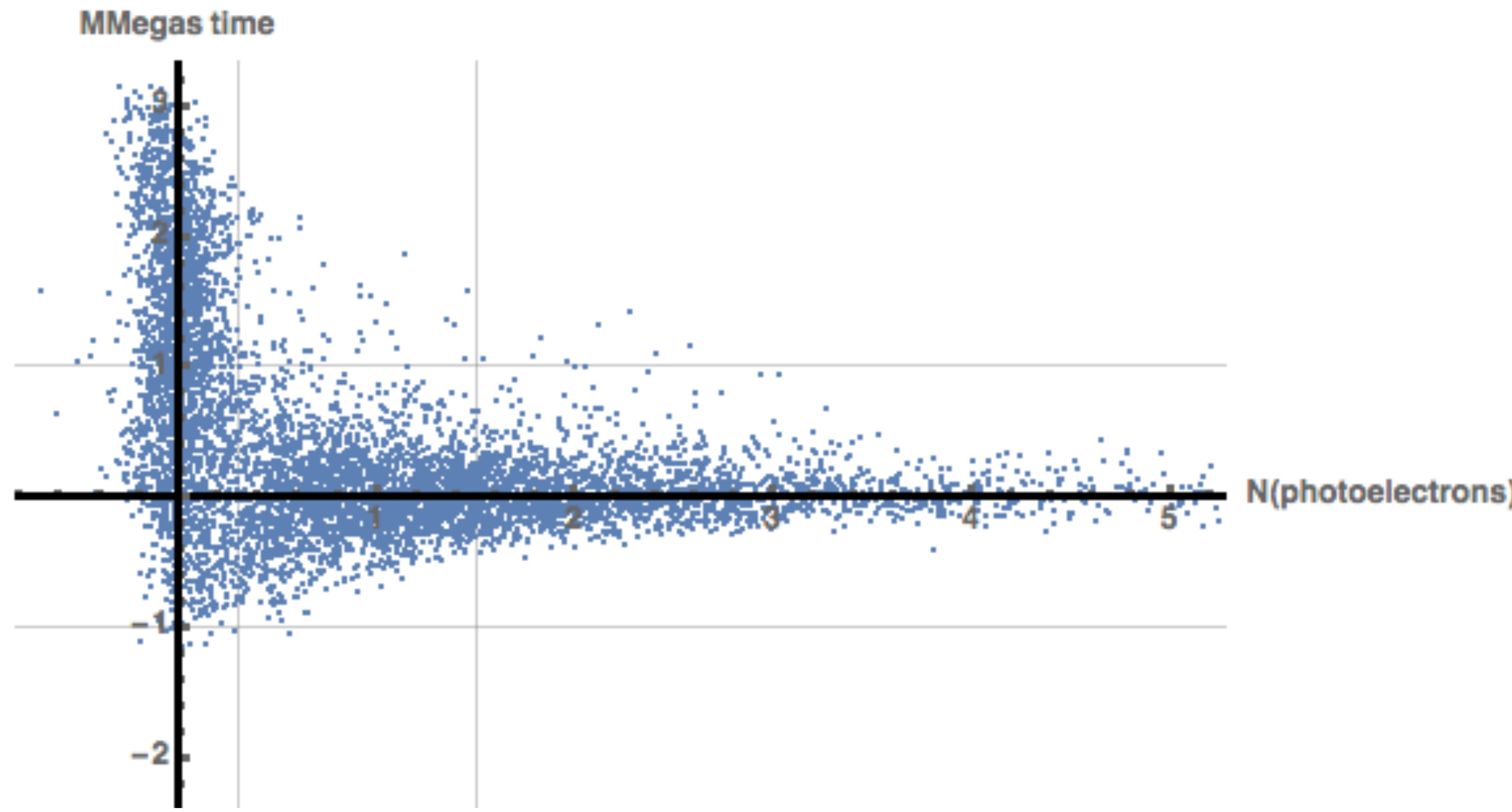
$$\text{templatefit}(\text{x\_}) := \sum_{i}^{61} \text{avewave}[[i]]\ \text{sinc}\left(\frac{\pi\,(x - \text{ttt}[[i]])}{0.1}\right)$$

Sinc expansion fit to Template Single pe waveform

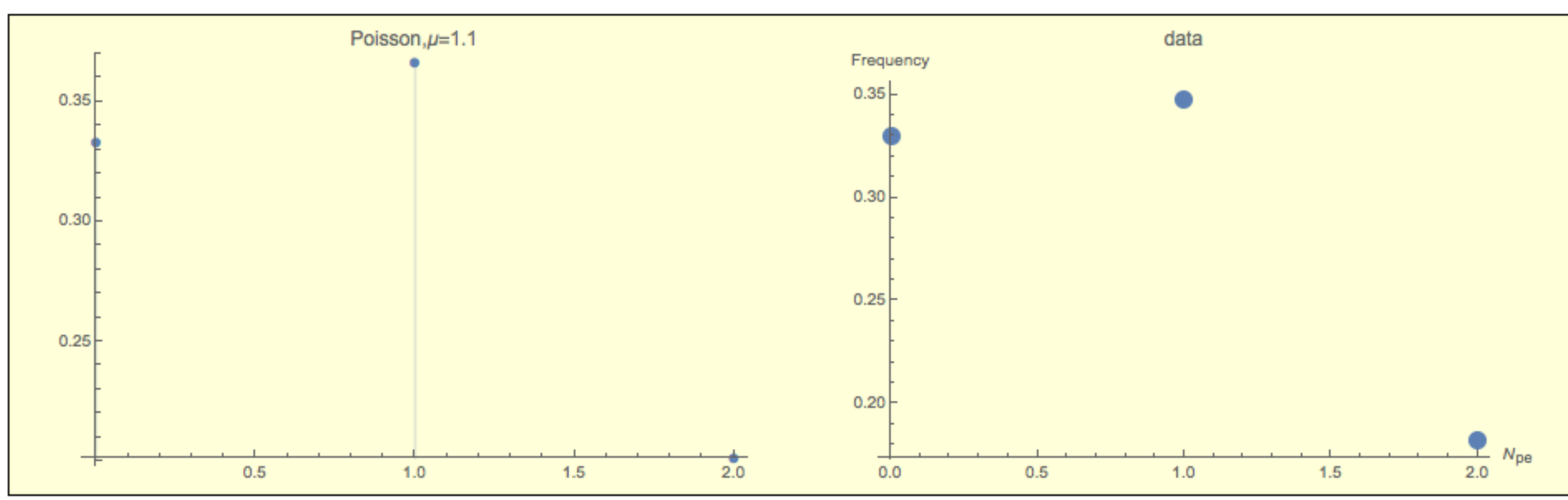
Out[148]=





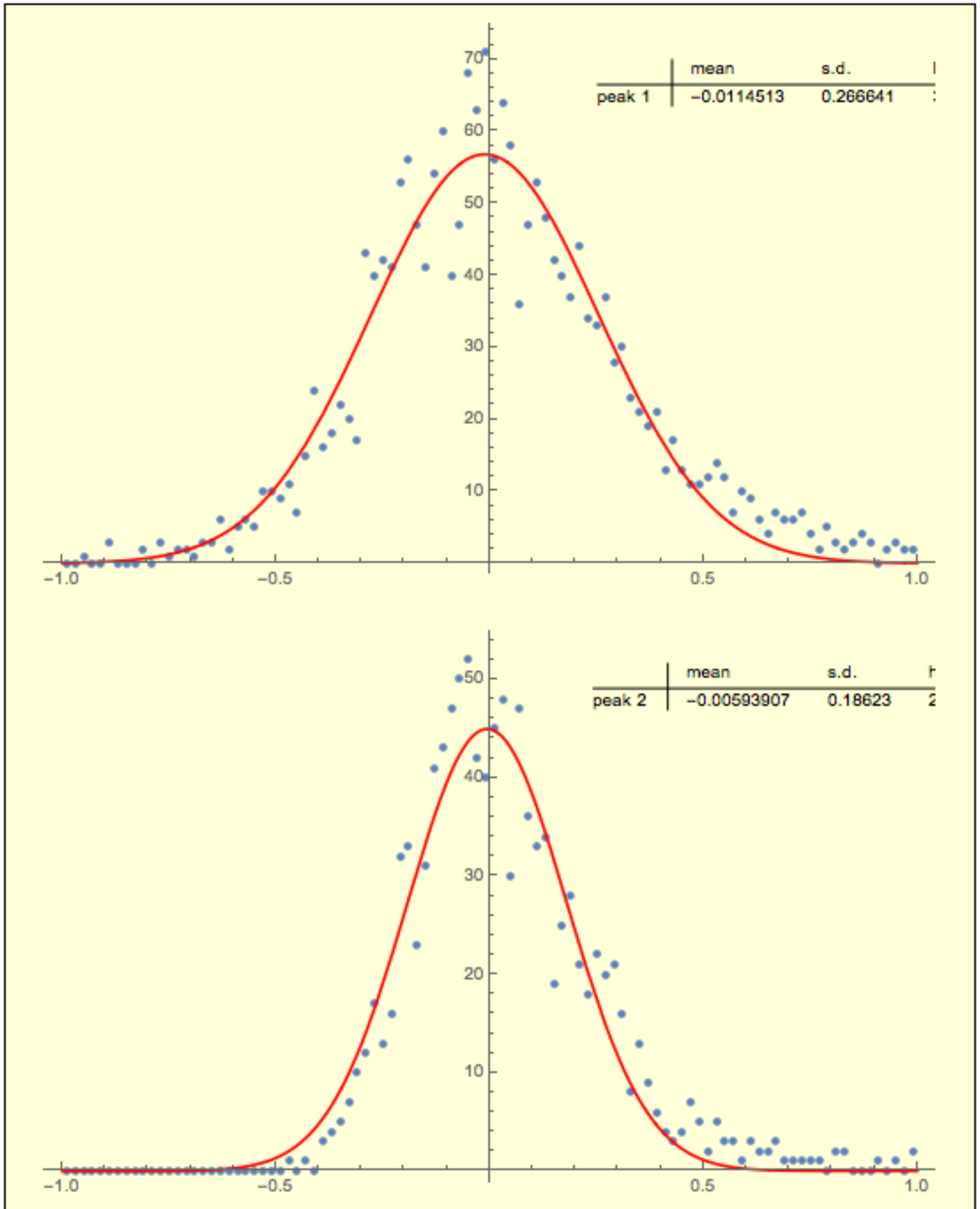


Best fit to N_{pe} Distribution, μ=1.1±0.1



Time jitter for 1,2 pe

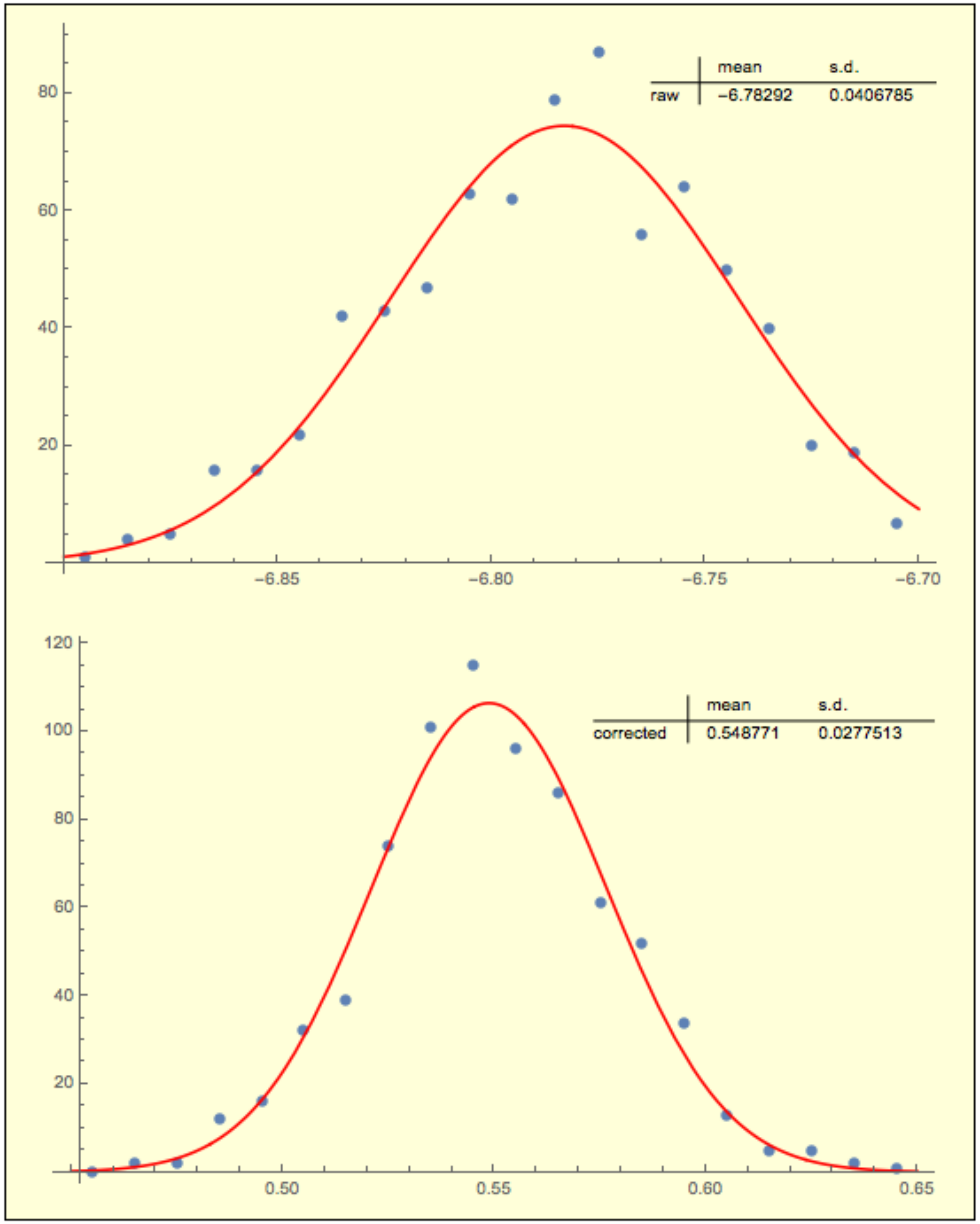
Best fit time jitter with 1,2 photoelectrons

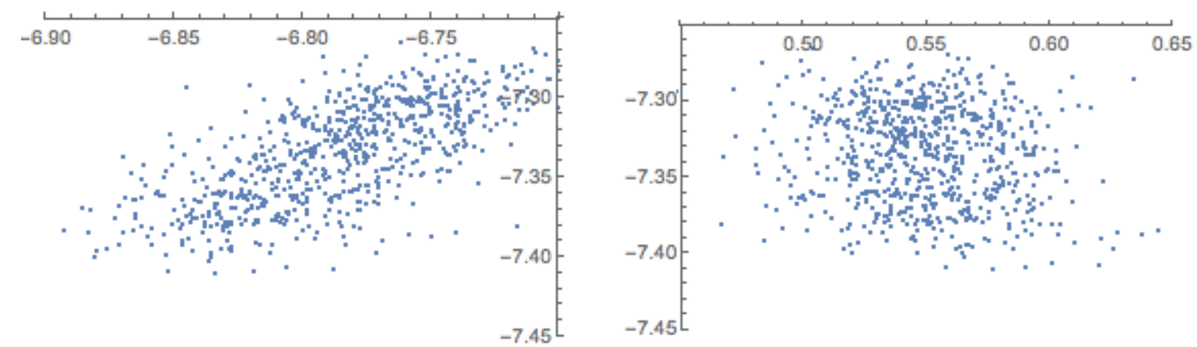


Caveats:
1)robust method for 1,2 photoelectrons is template fit
2) for higher Npe find that CF method better
3) also some overlap of 1,2

for large Npe correlated jitter from scope trigger easily corrected e-by-e

Fit to MMegas time jitter and including laser PD correction, $\langle N_{photoelectron} \rangle$=45





many internal checks on
Npe vs. run

1) recalibrated optical filters
2) line width ~1/Sqrt[Npe]
3) amplitude

Summary of Ne-Ethane(10%): Efield=10kV/cm; Drift Gap =0.2 mm
1,2 pe data points consistent with 10% worse template method
fitted curve->~2xbetter than Sigma(diffusion)