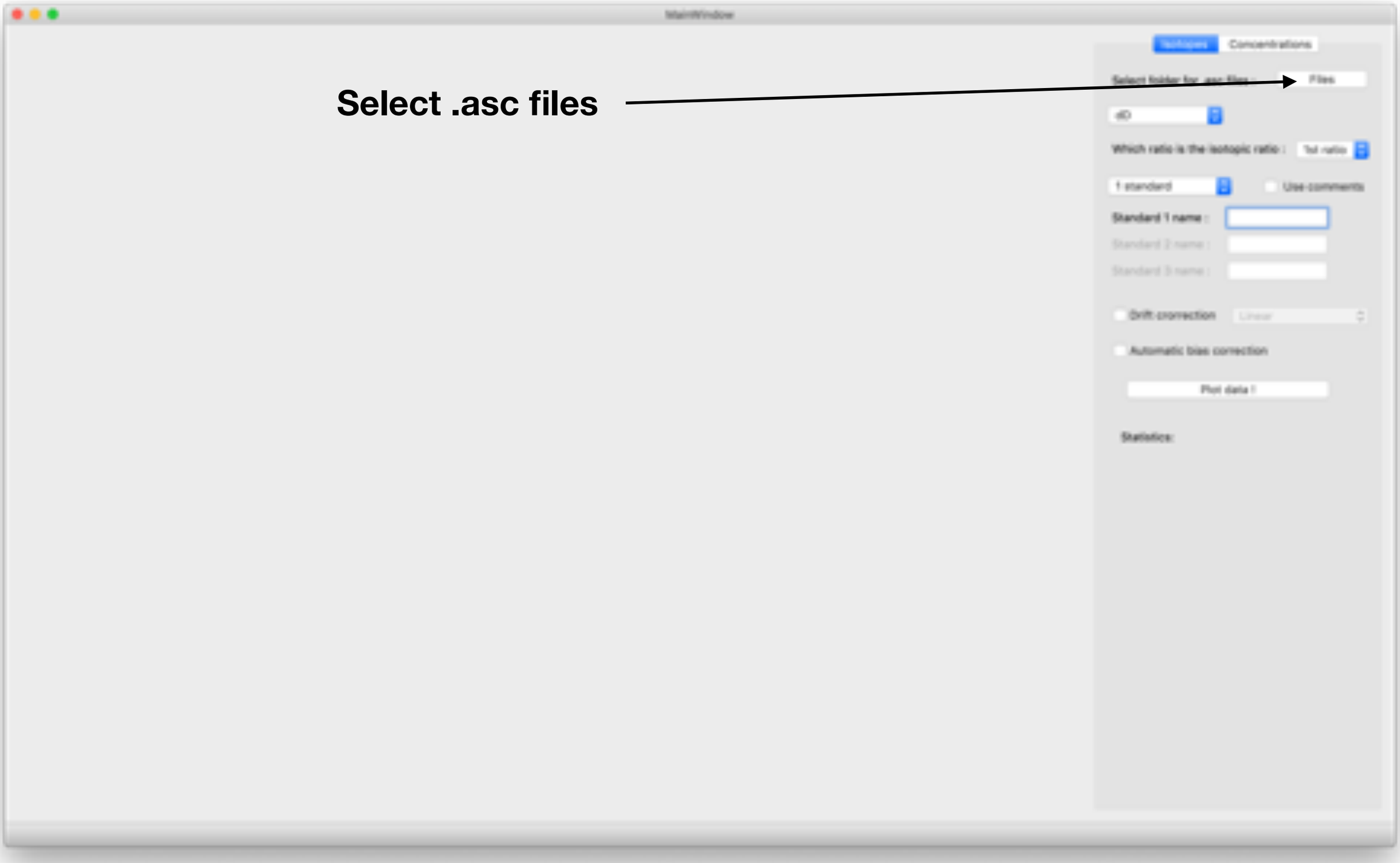
ProceSIMS tutorial

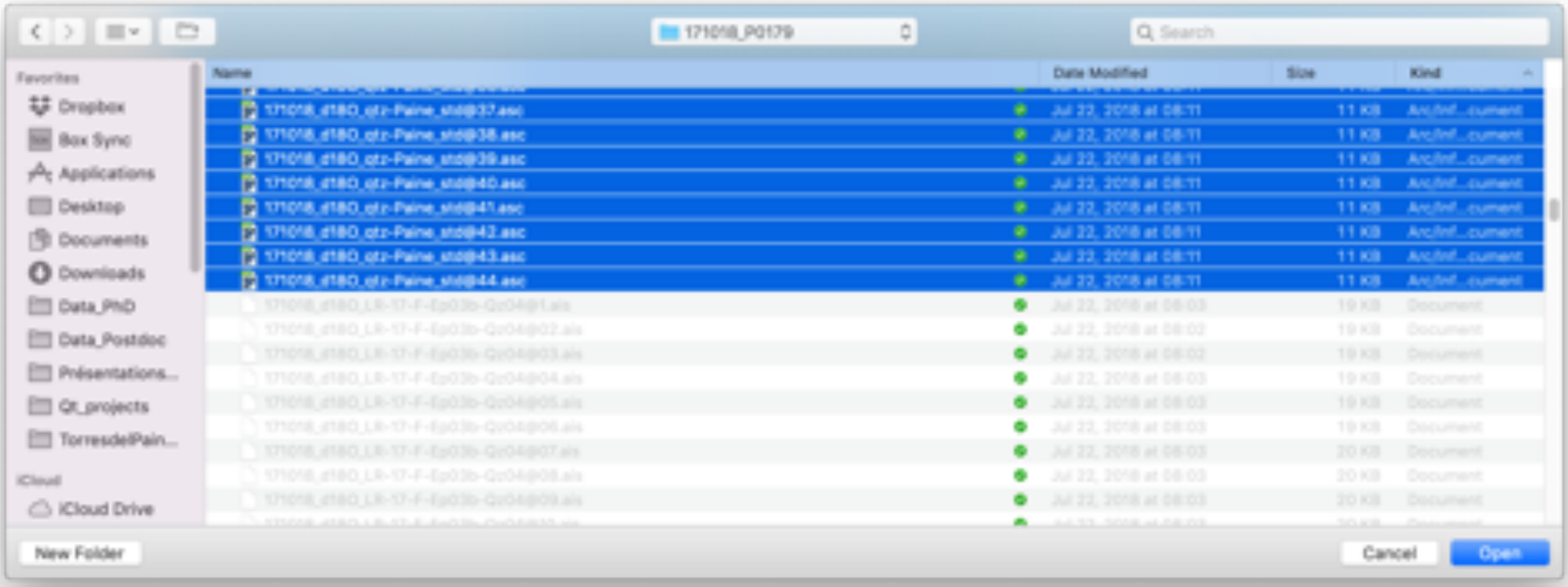
ProceSIMS is a standalone application coded using Python. It allows to process any SIMS data generated using a CAMECA ion probe. It can correct for drift, instrumental bias and automatically propagate uncertainties.

By clicking on the ProceSIMS app in your Application folder, the App will automatically be launched.

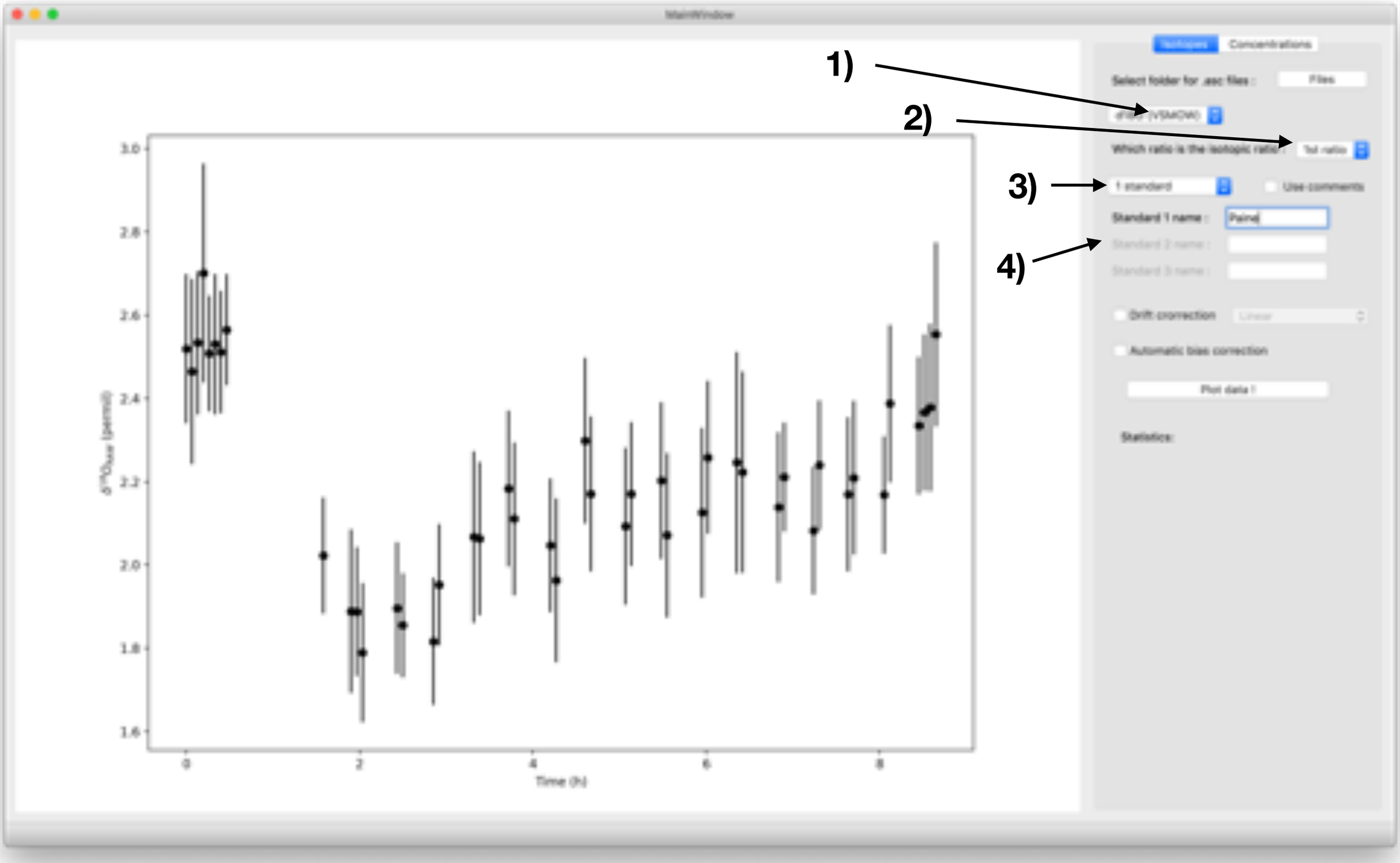
The application is divided into two sections, on the left where standards are plotted against time and on the right where the user can select the different input/ conditions of analyses.



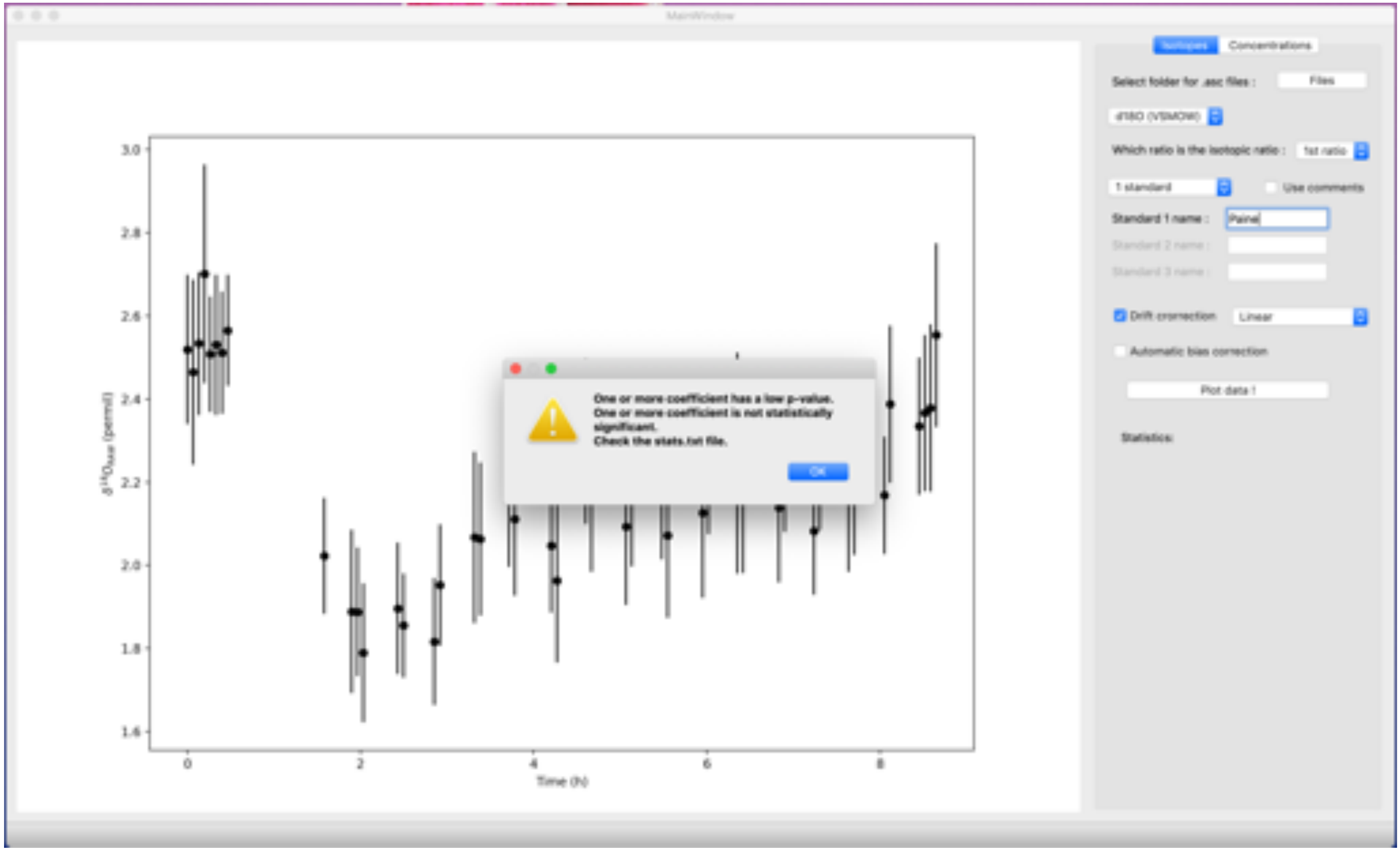
You can select part of your session or the entire session at this point. You will be able to select part of the session within the App, more on that latter.



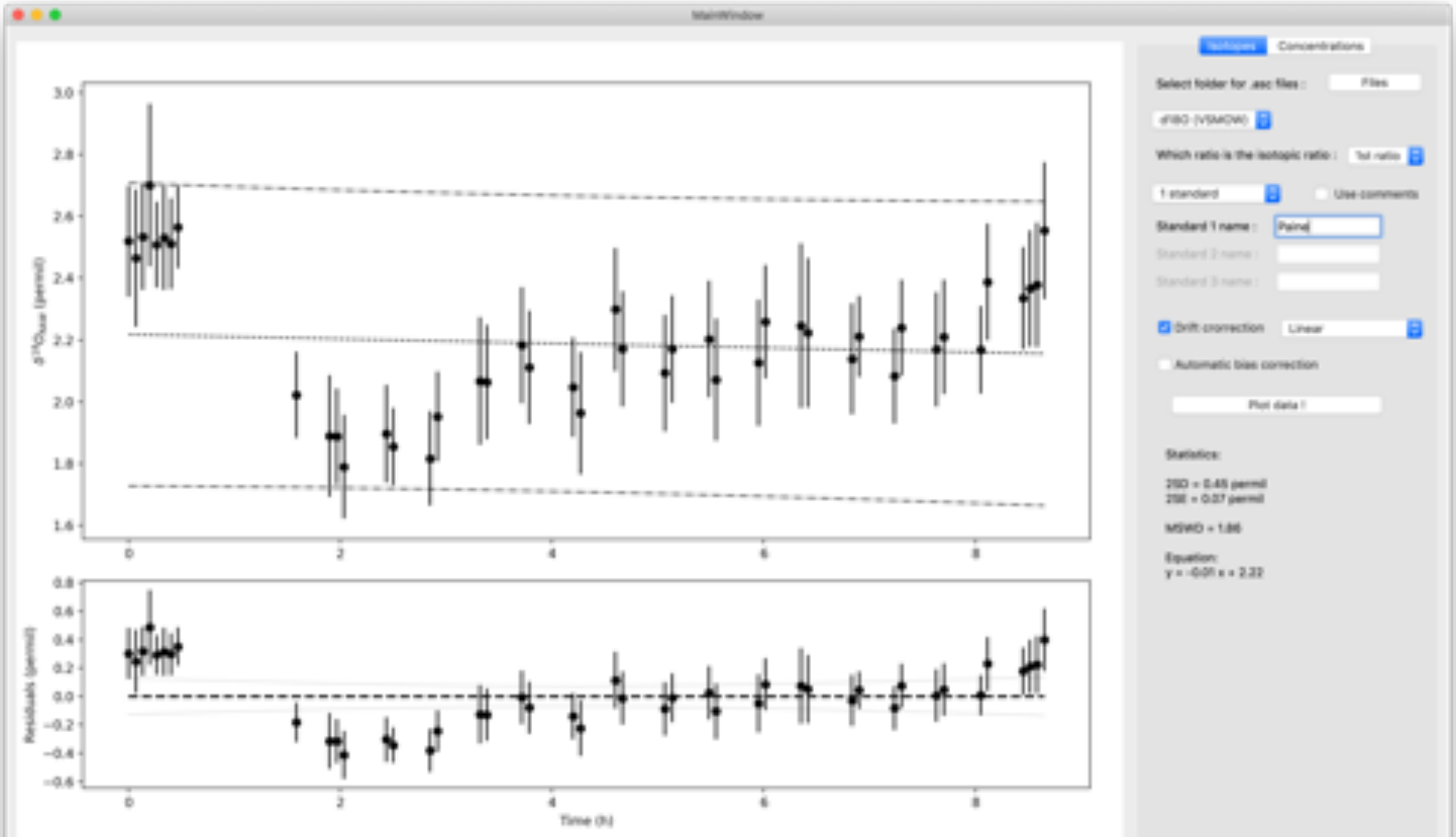
At this point you can select the isotopic system (1), which ratio is the isotopic ratio, i.e. first ratio is R0 in CAMECA ascii files (2), the number of standards to be considered, max 3 (3), their names (4). Whenever you change a condition, click on Plot data !, otherwise it will not be taken into account.



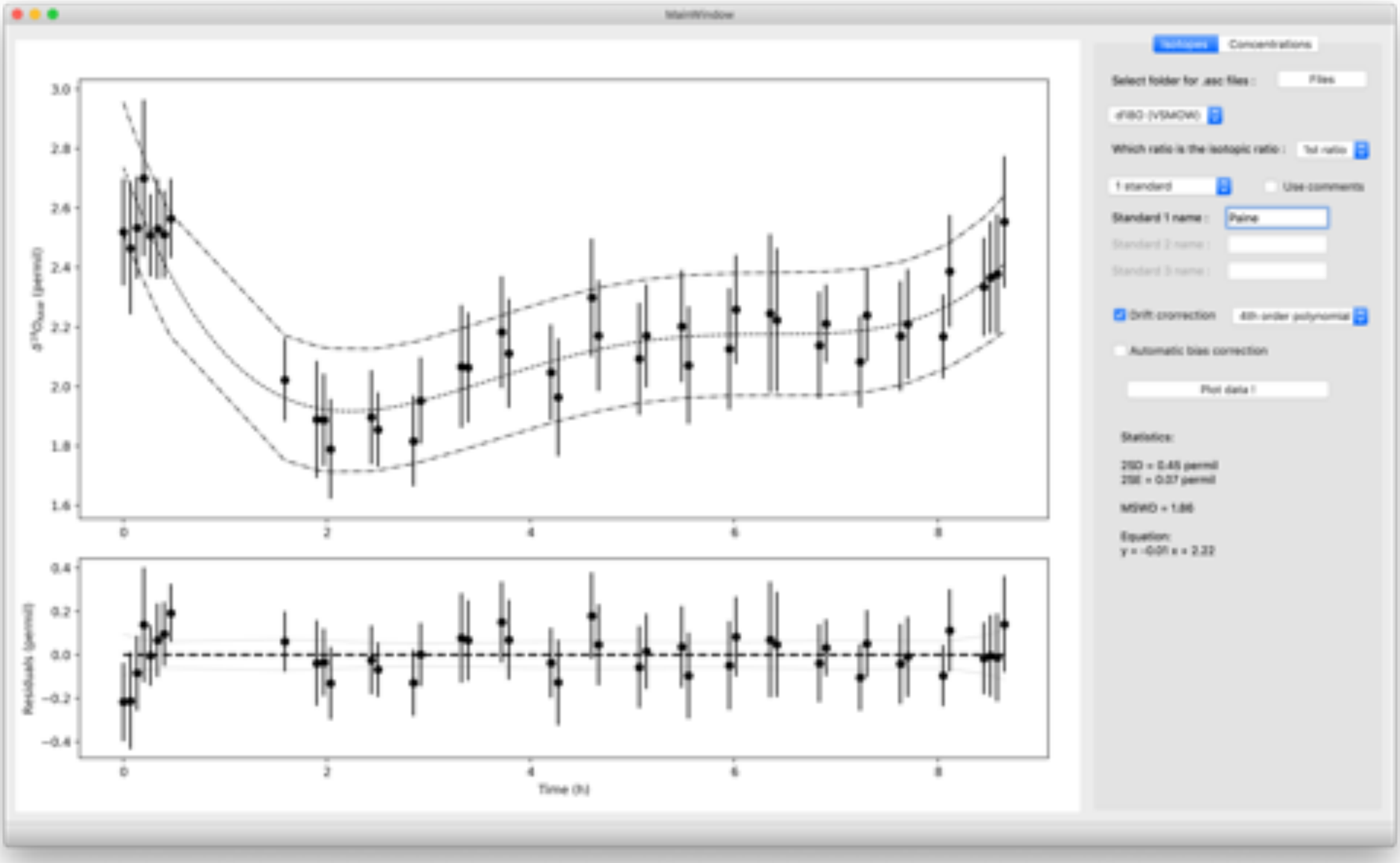
When drift correction is enabled, if one or more coefficient as a low p-value, a pop-up window will appear.



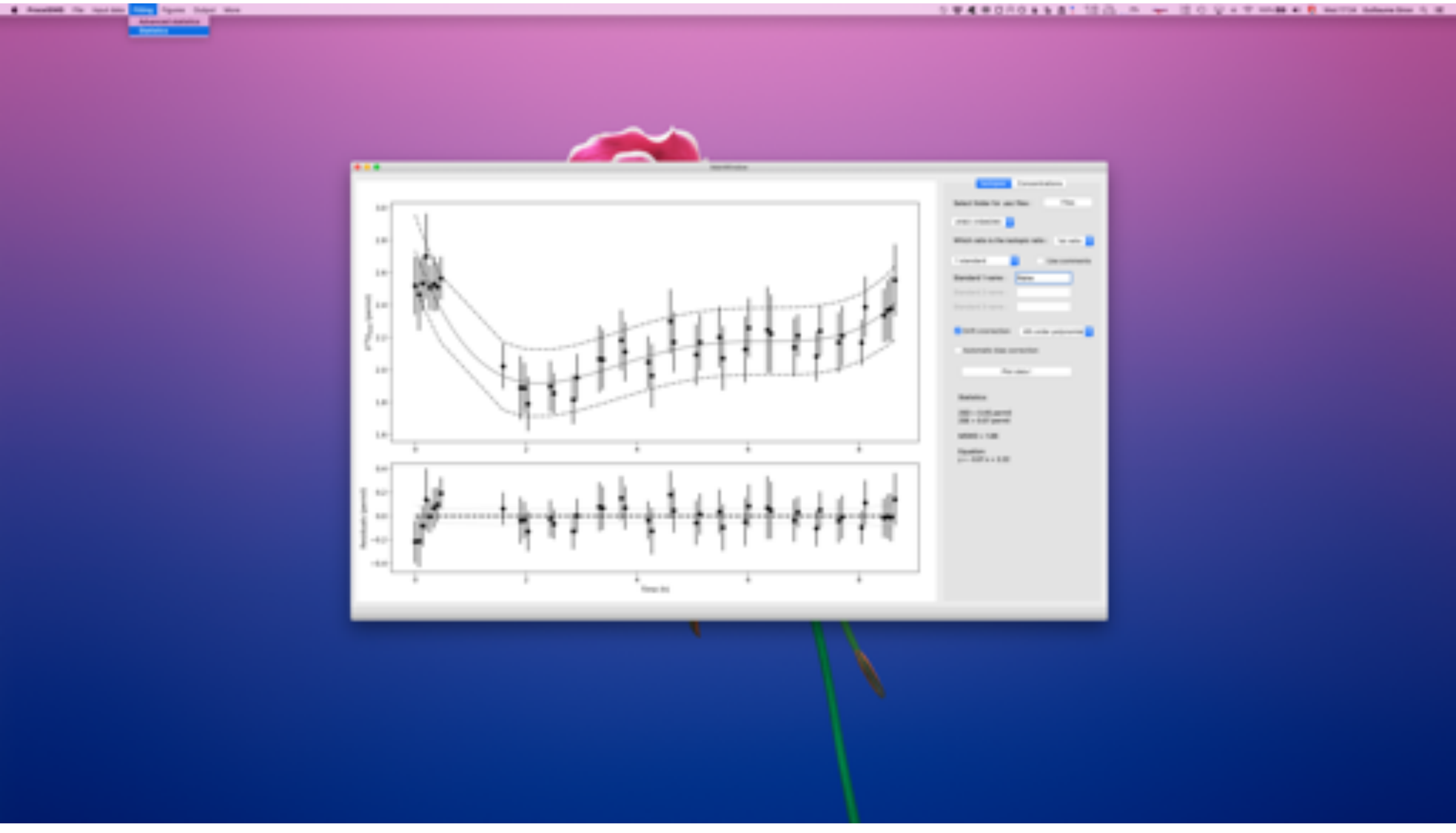
Of course the result is not satisfactory…



With a higher polynomial degree the fit is much better and there are no pop-up window.



Nevertheless you might want to check the full statistics of the fit by clicking in the menu bar: Fitting : Statistics



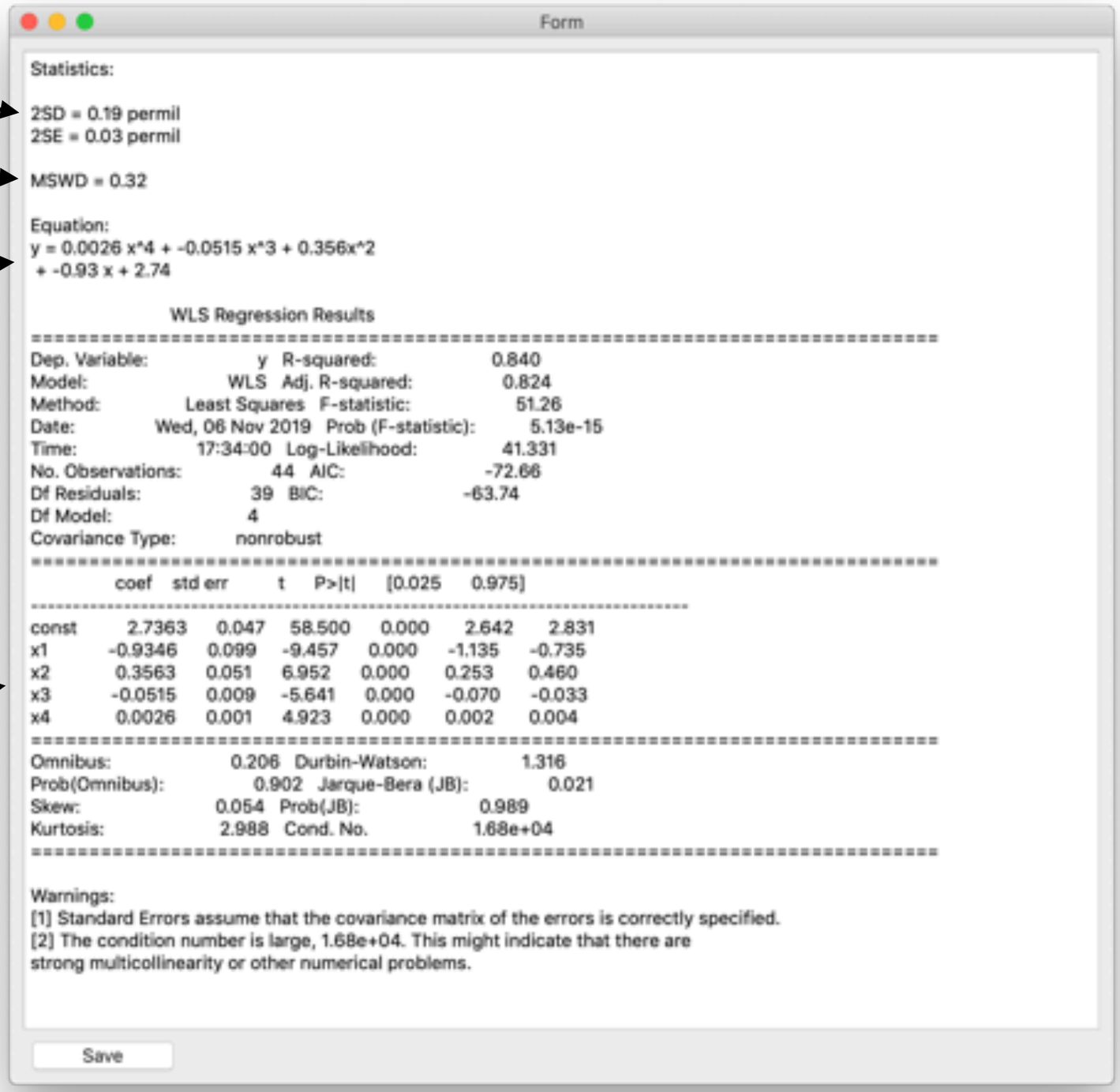
You can now see the different informations

2SD and 2SE for std

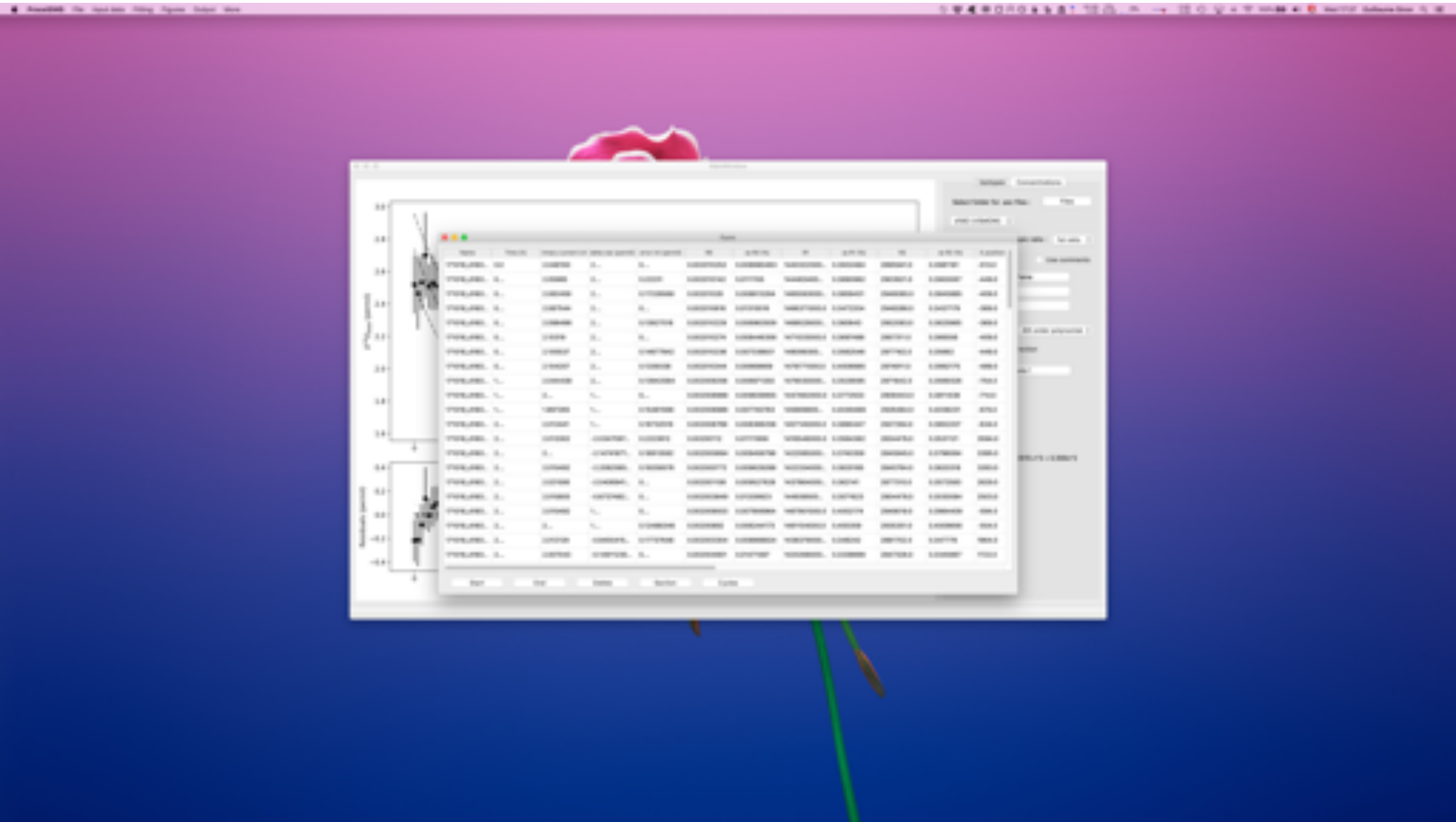
MSWD for std

Equation of the fit

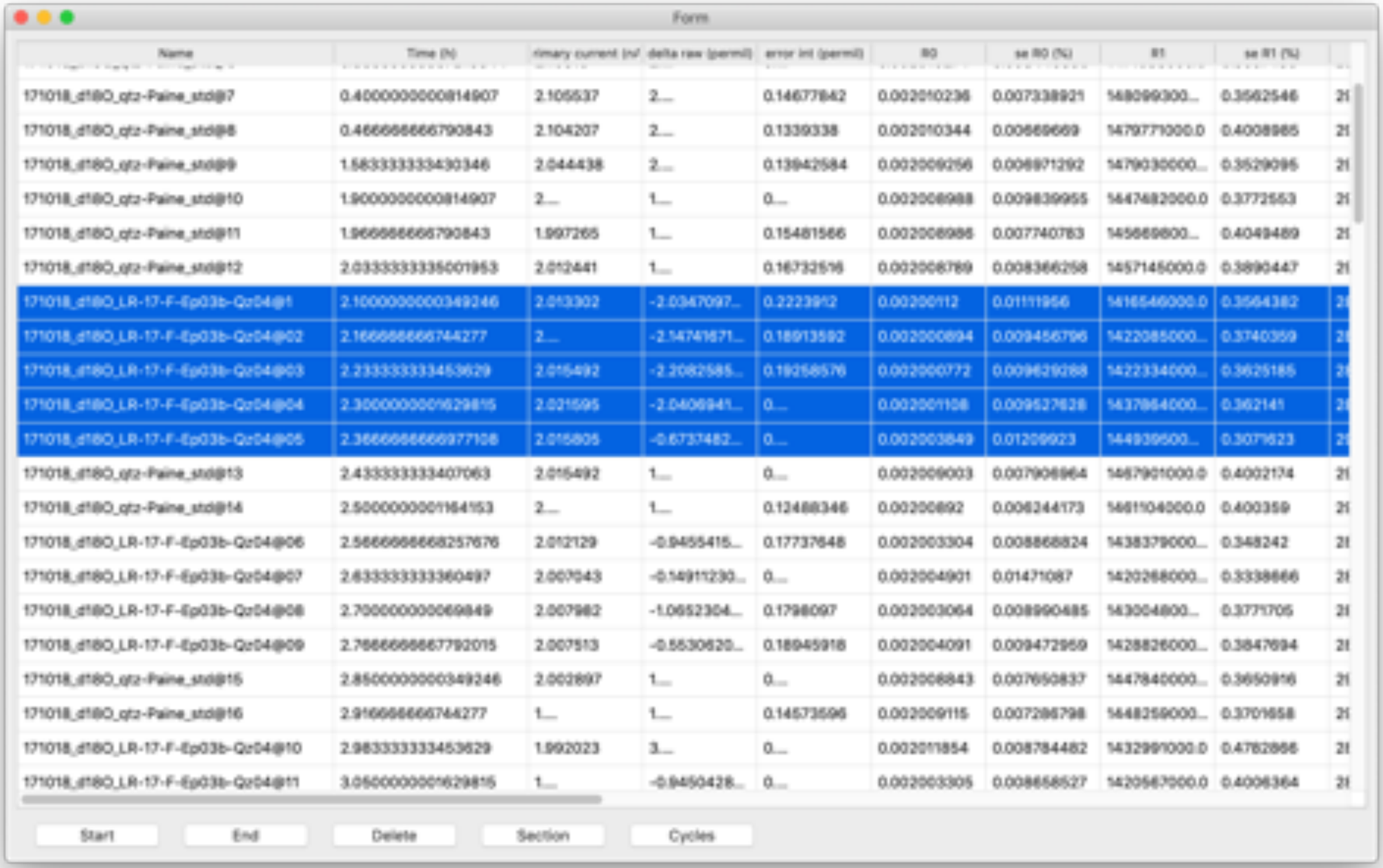
Coefficients along with their uncertainties (std err) and comparison of P-values to student t-test tables (P>|t|)



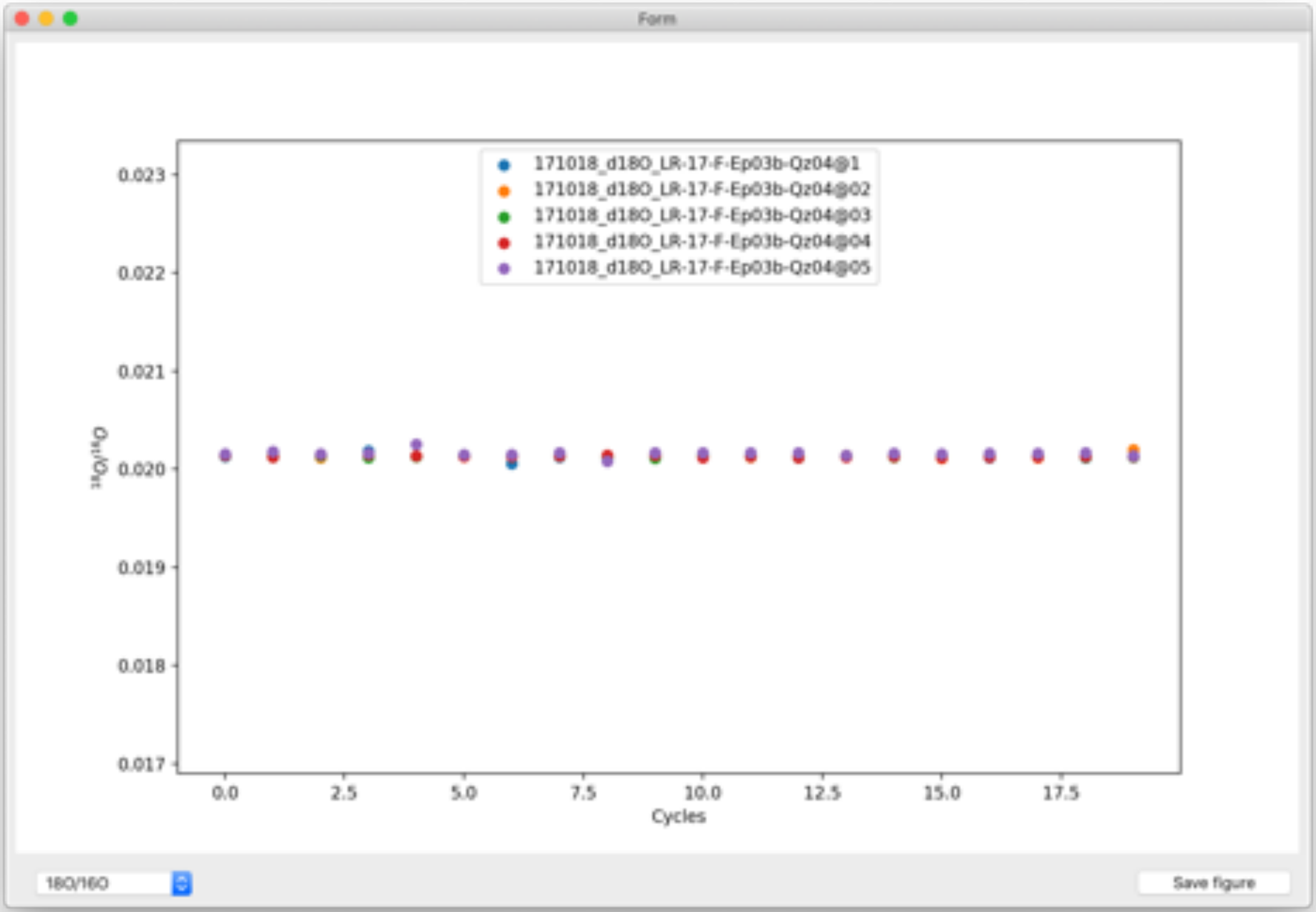
If you want to modify the data selection to be considered, click in the menu bar:
Input data : Data



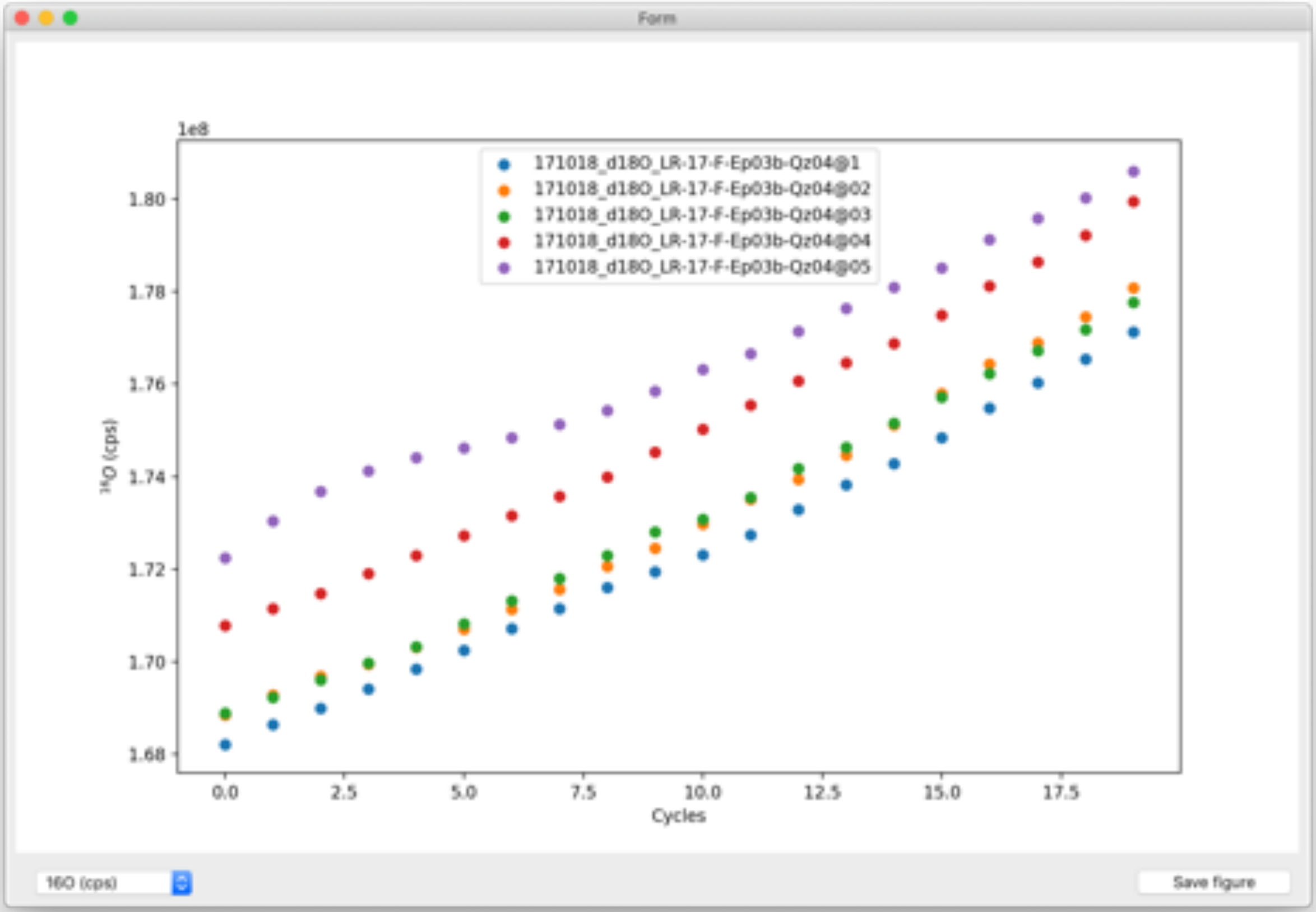
If you want to see the cycle data for some analyses, you can click on the corresponding rows, then click Cycles at the bottom of window



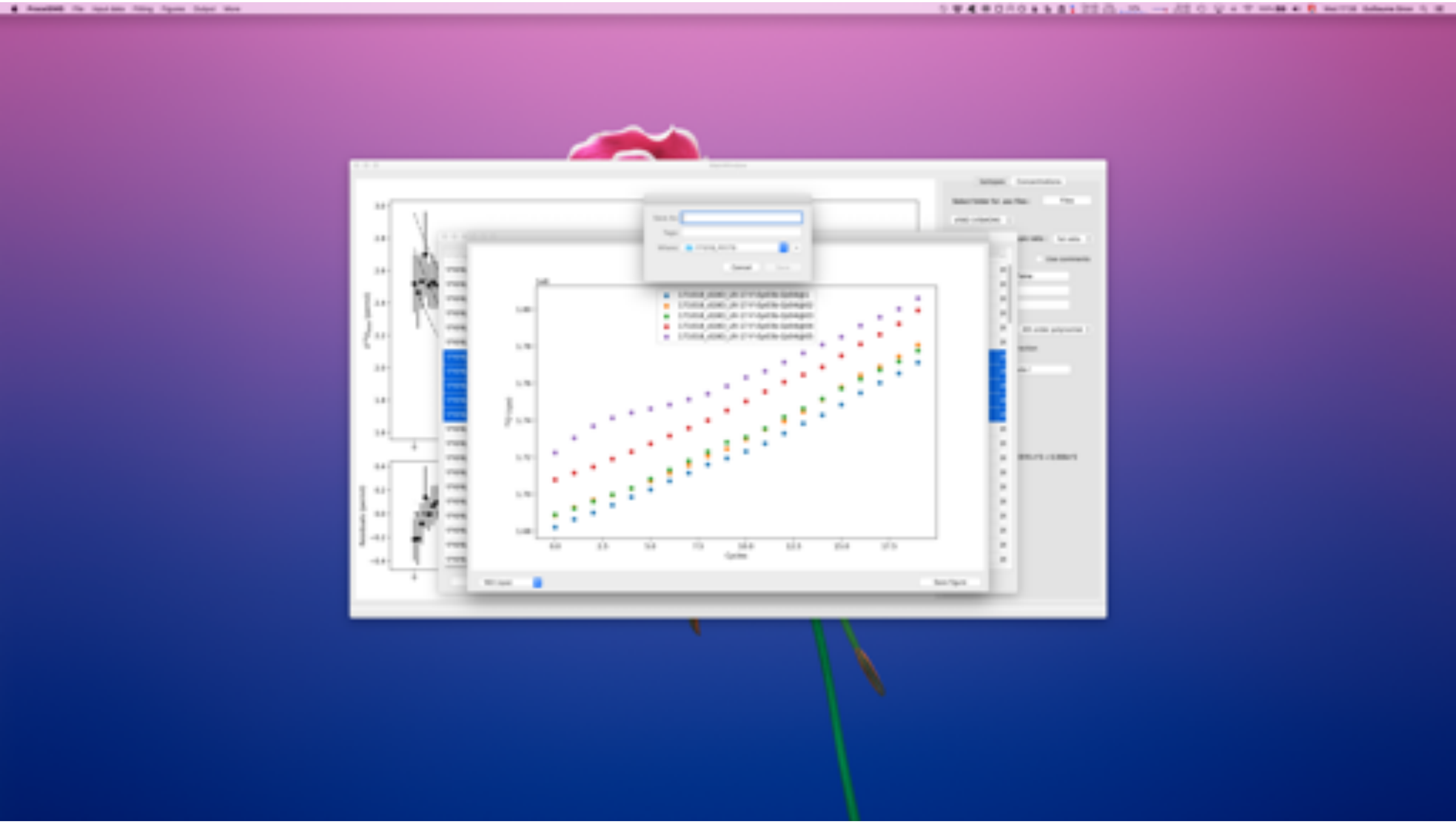
In this case the analyses where divided into 20 cycles.



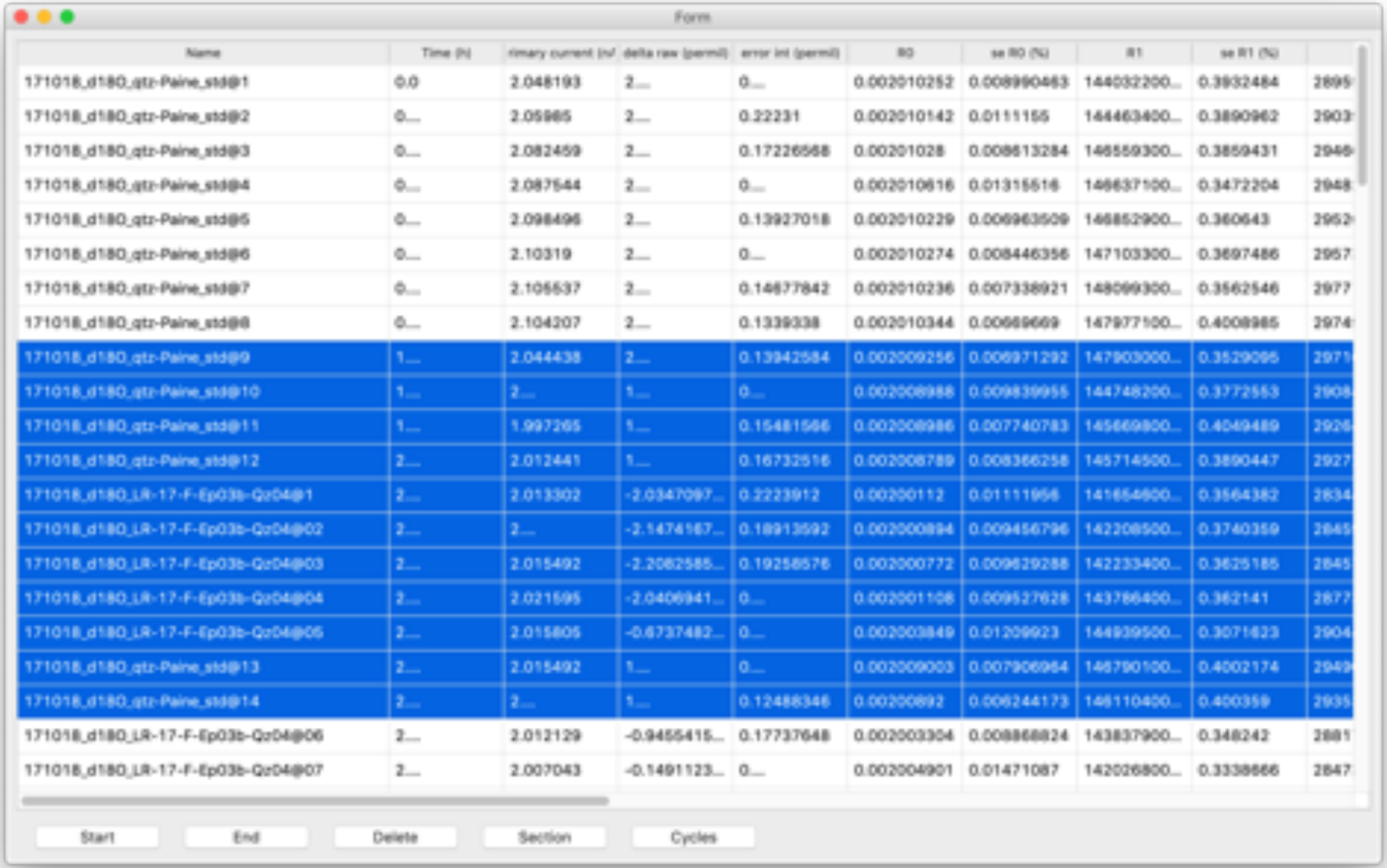
You can access the counts for each isotopes using the combobox on the lower left of the window. If you want to save this figure, click on Save figure on the lower right of the window.



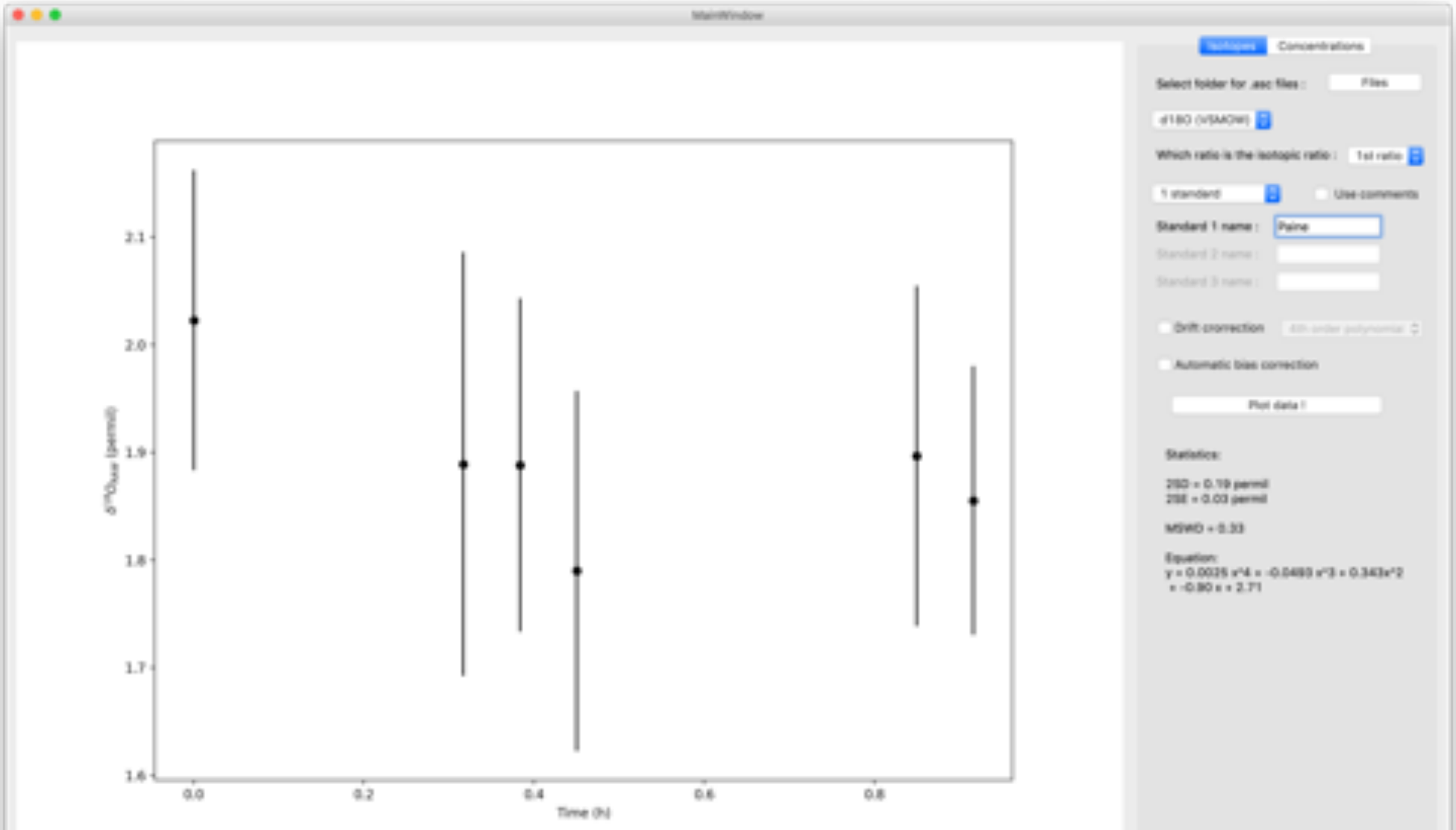
You can select any location in your computer and enter any name for the analyses, it will be saved into a .eps format.



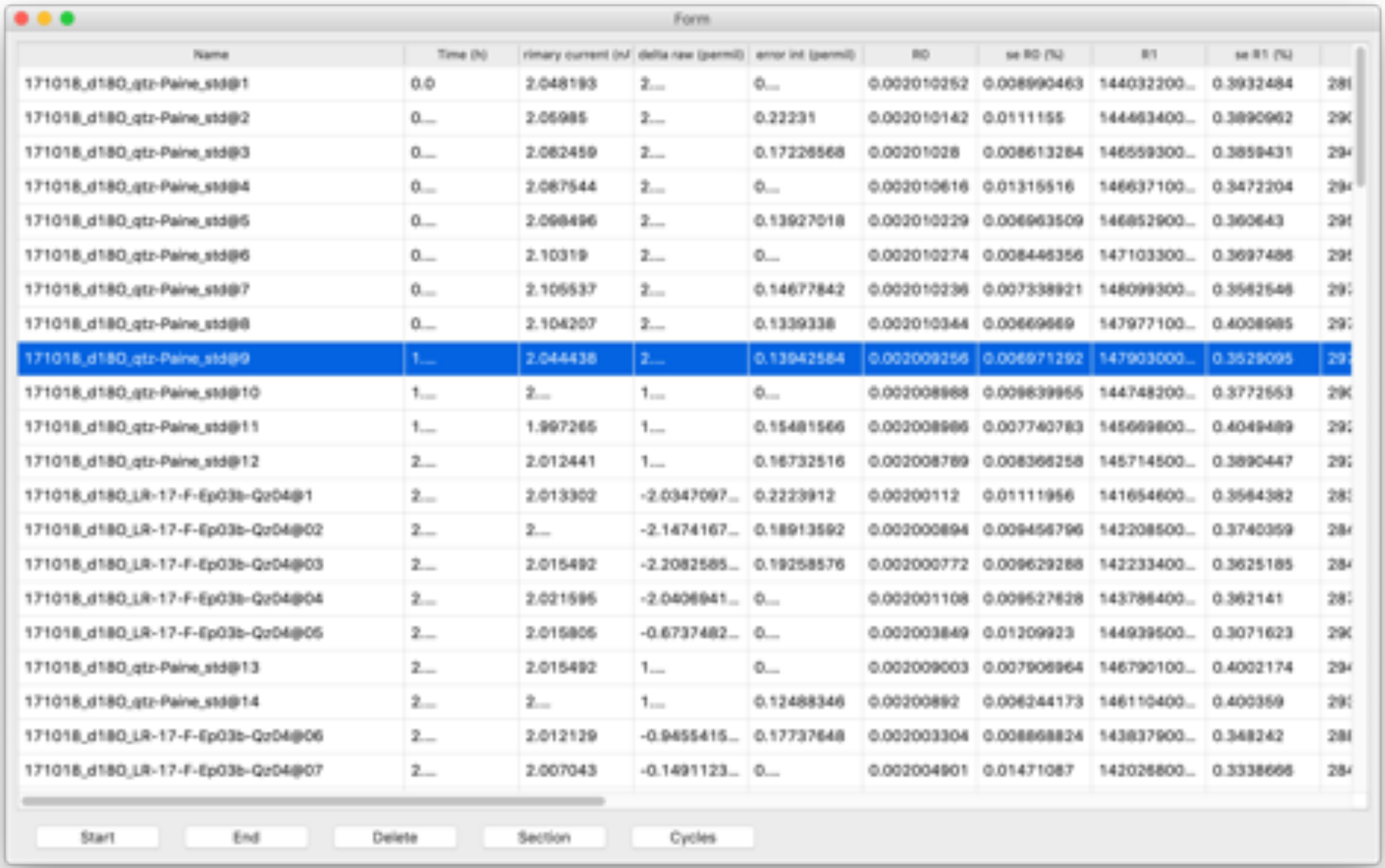
If you want to select only some analyses you can click on them to hi light a portion of the session, then click Section in the bottom of the window.



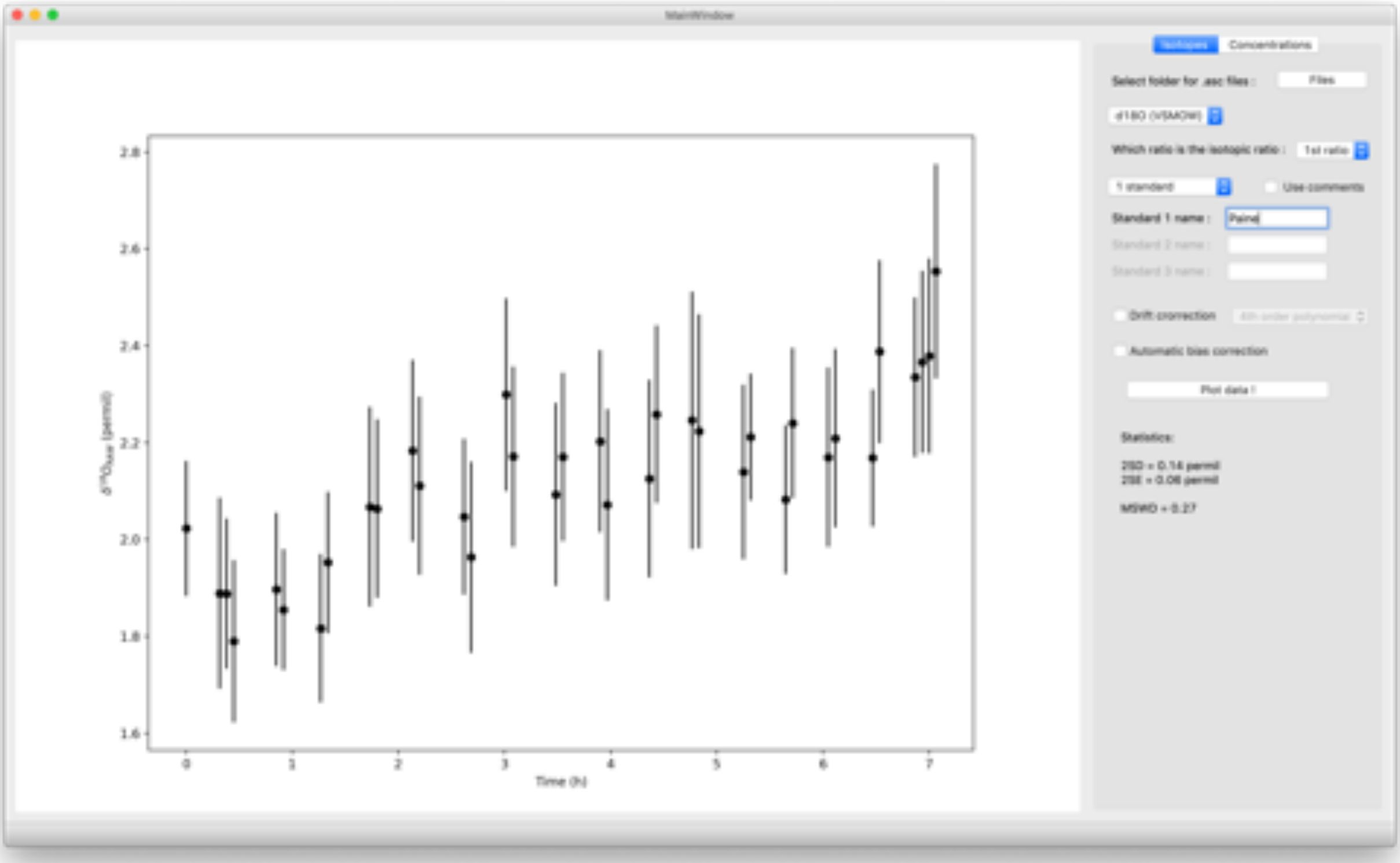
Again to take into account the change, click Plot data !
If you want to consider the whole session again, just go back to the data window, select the entire session and click section.



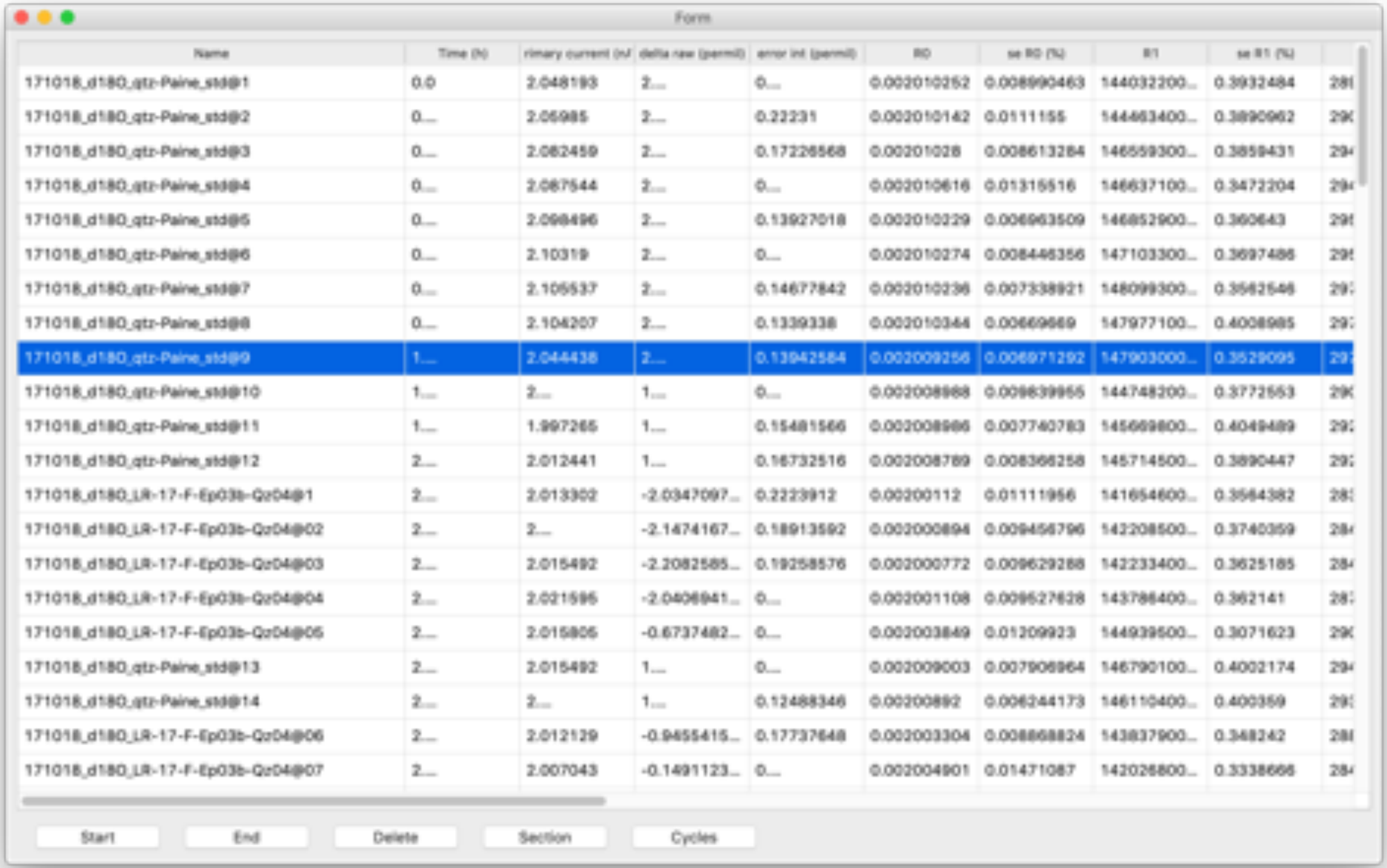
Now if for example you want to start your session after a few analyses, select the analyses you want to specify as the new start and click Start at the bottom of the window. Be careful, this will permanently delete all previous analyses.
You might want to use section instead.



In this case, it has deleted the first 8 analyses.

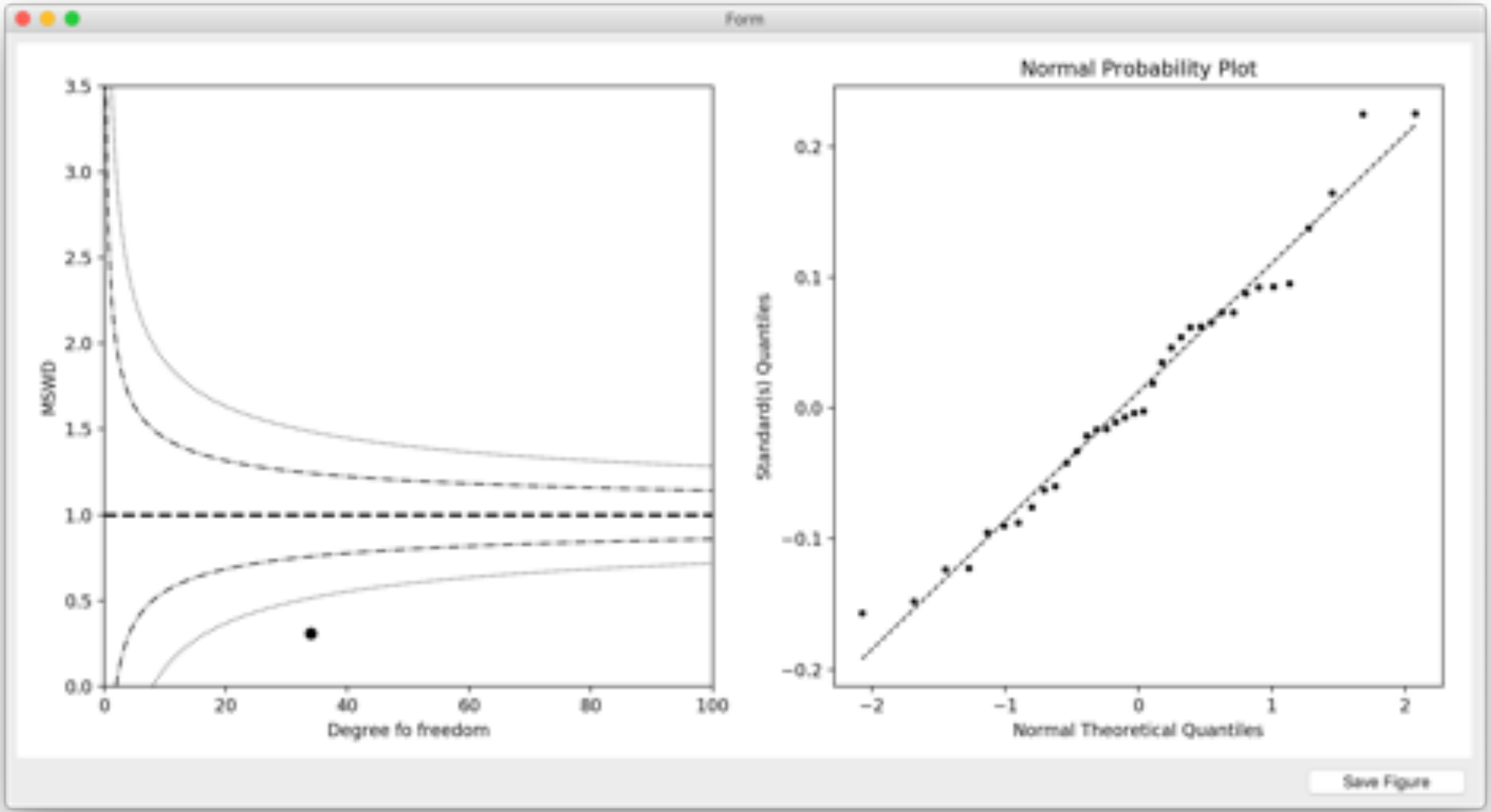


You can also delete a specific analysis by clicking Delete or specify a new end for the session by clicking End. Again this will permanently delete the analyses.

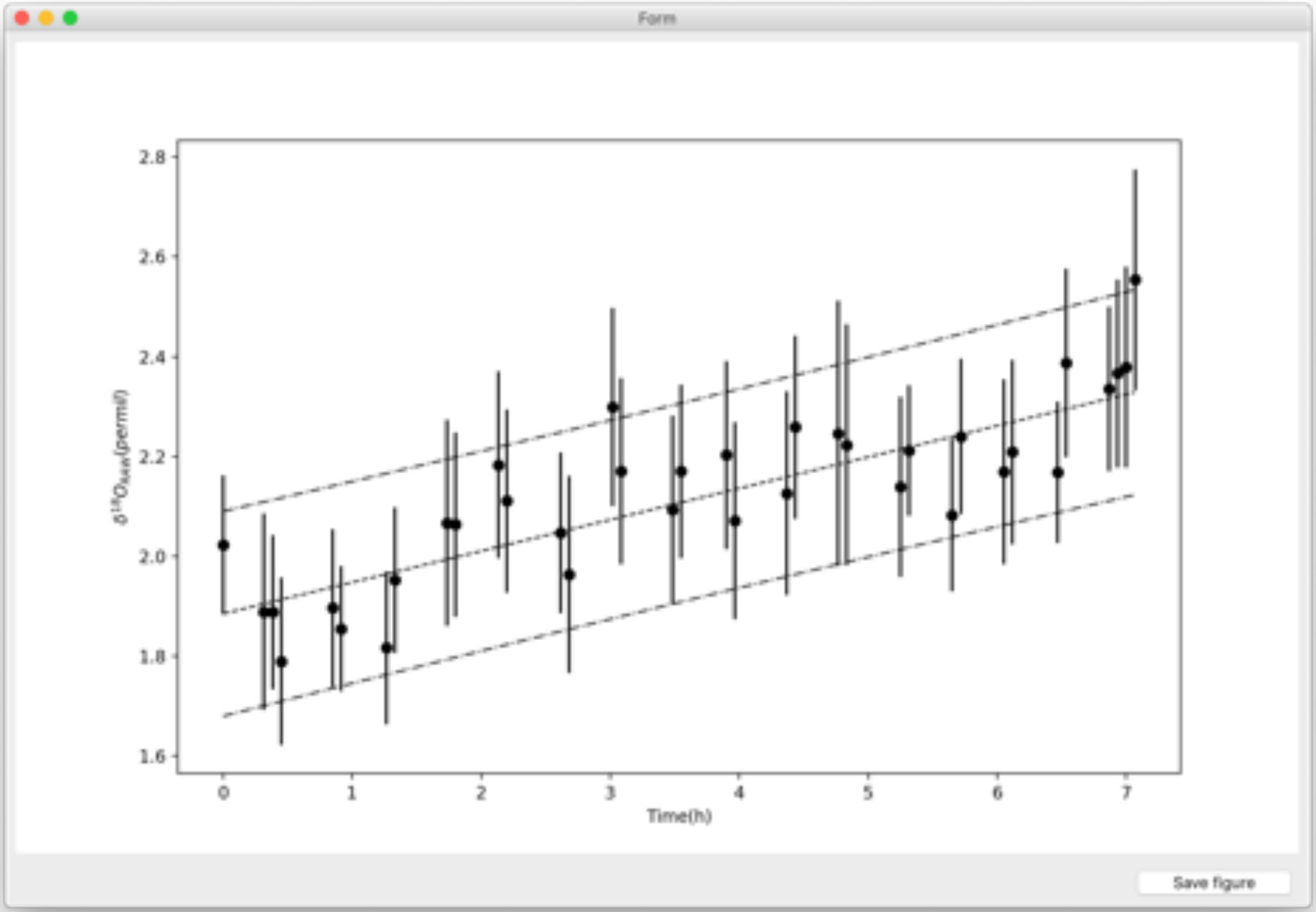


You can access additional information about your session by clicking in the menu bar: Fitting : Advanced Statistics

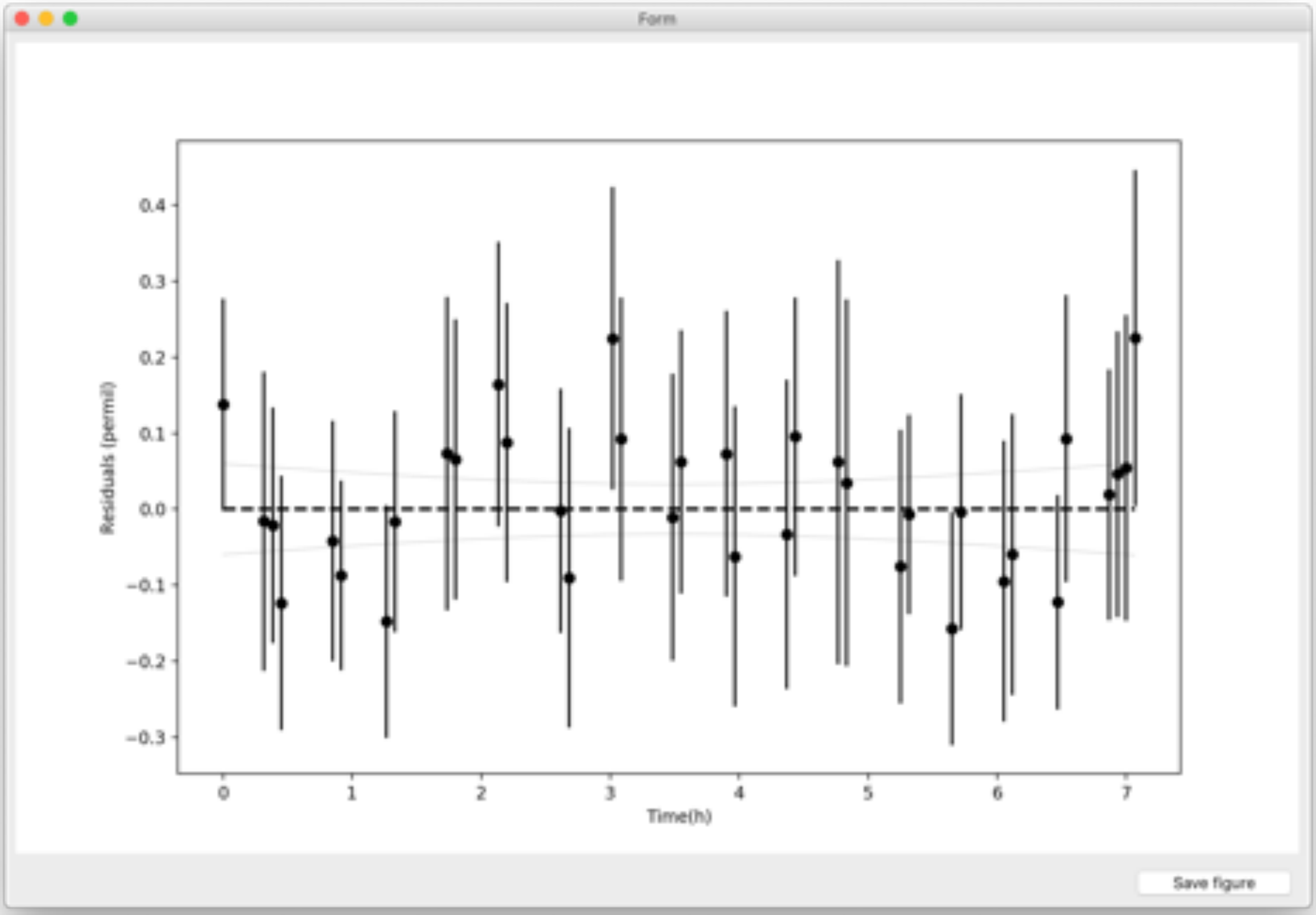
On the left is a plot of the measured MSWD of the session compared to 84% (dash-dot curve) and 95% confidence interval (dot curve).
On the right is the normal probability plot for the standard measurements.



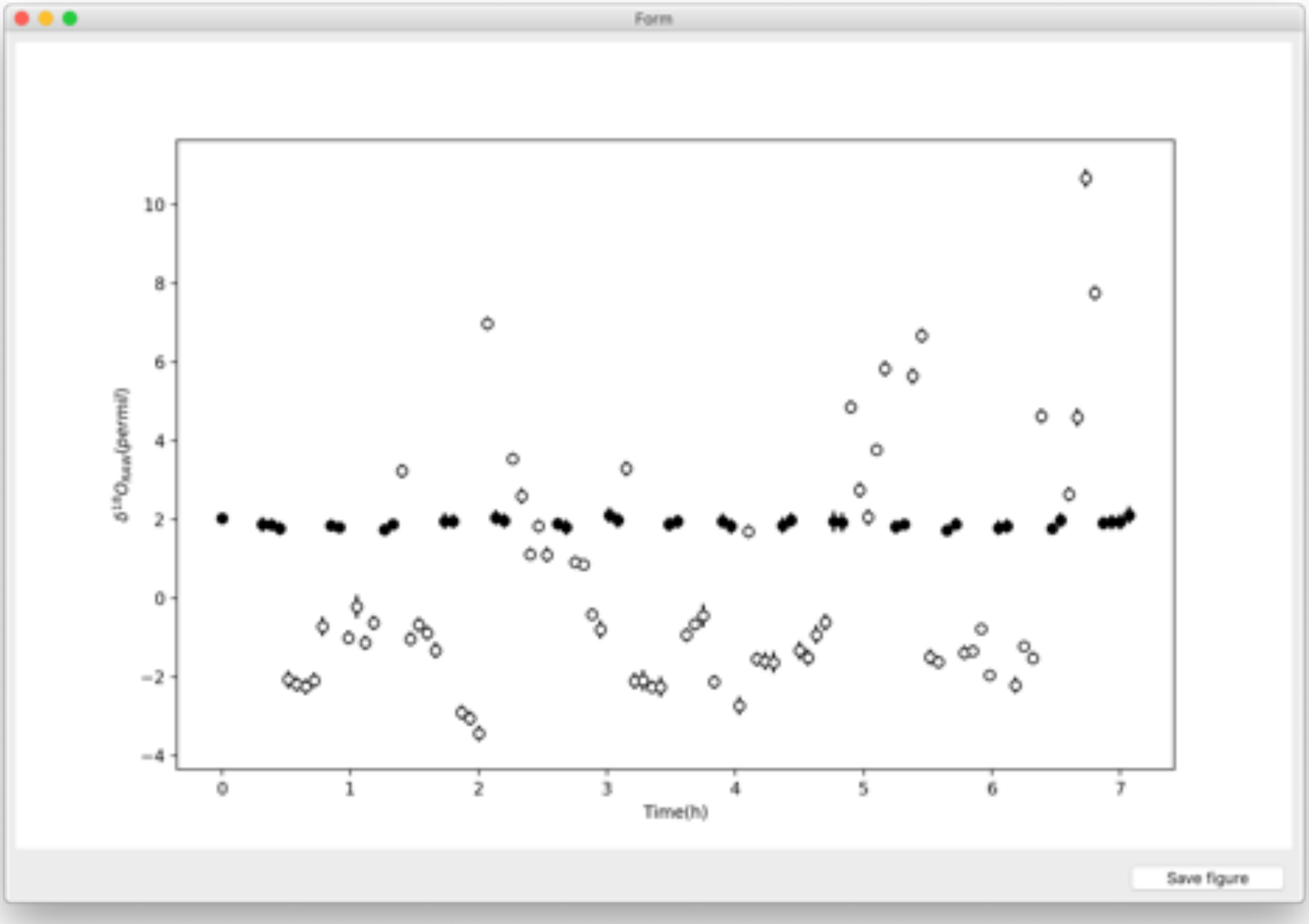
You can also access additional figures by clicking in the menu bar:
Figures : Standards



You can also access additional figures by clicking in the menu bar:
Figures : Residuals

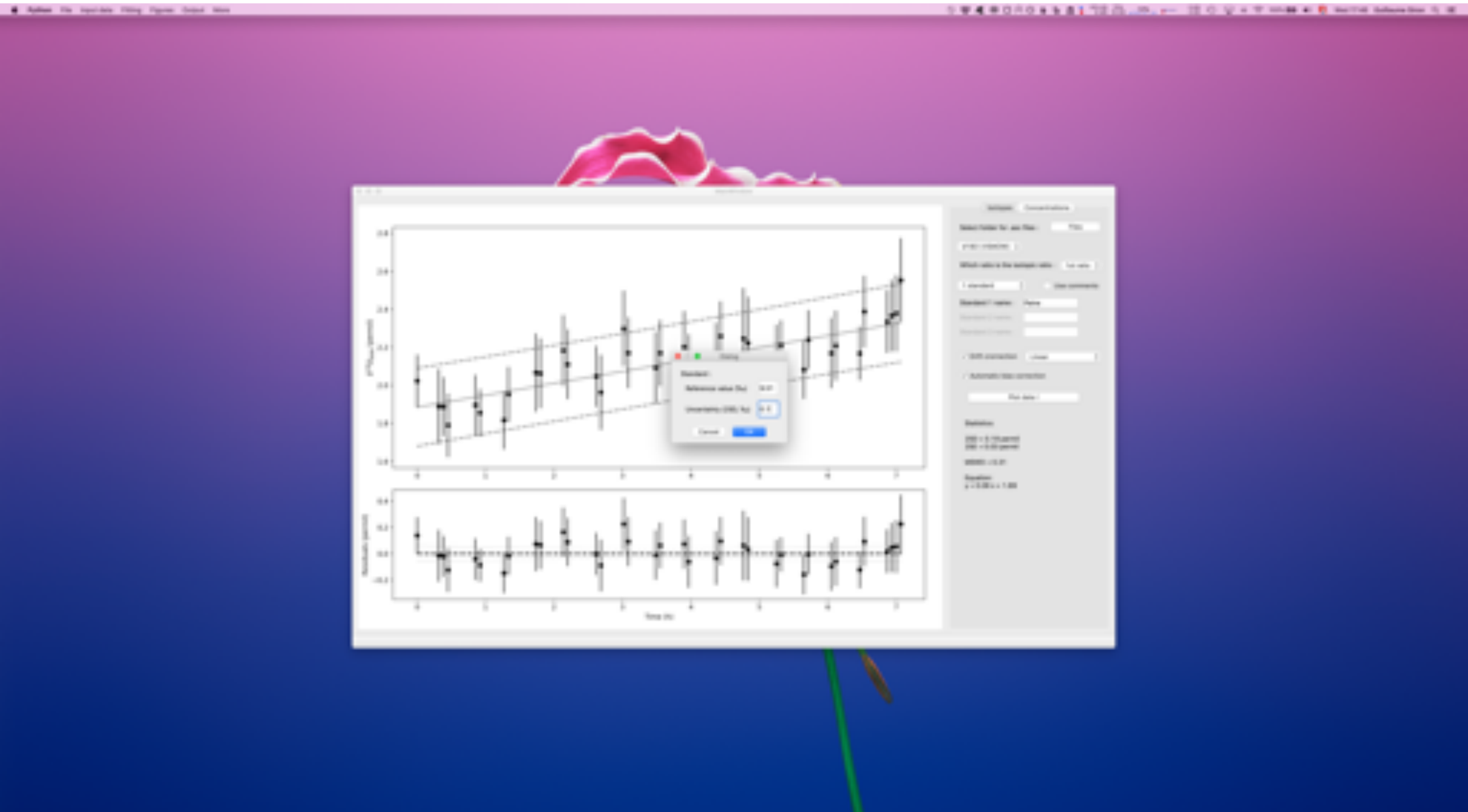


You can also access additional figures by clicking in the menu bar:
Figures : All data



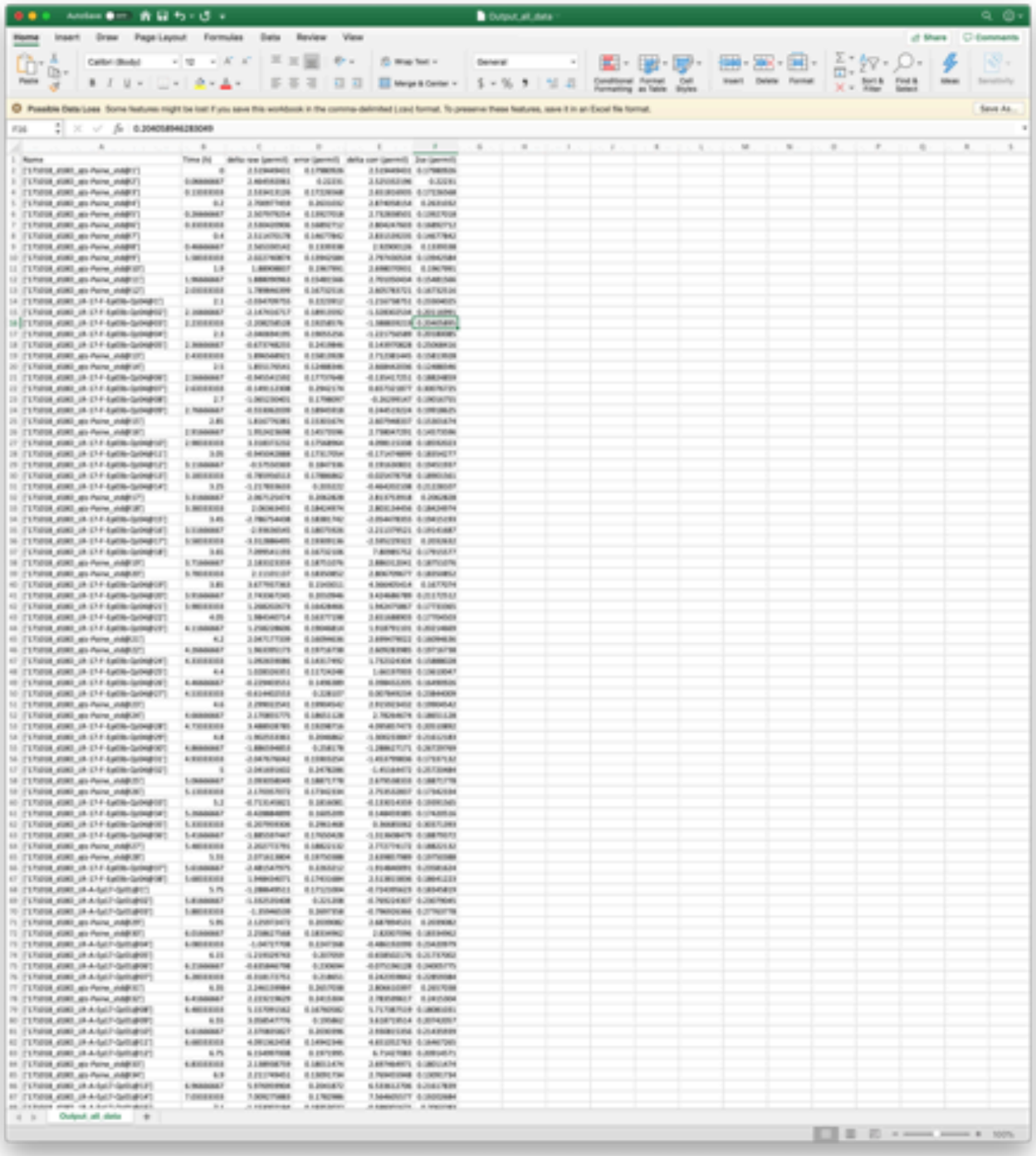
You can also correct for instrumental bias when only one standard is considered by checking the Automatic bias correction box

A window will pop-up to enter the reference value and uncertainty of the standard, always hit enter or tab when you have finished to type the value

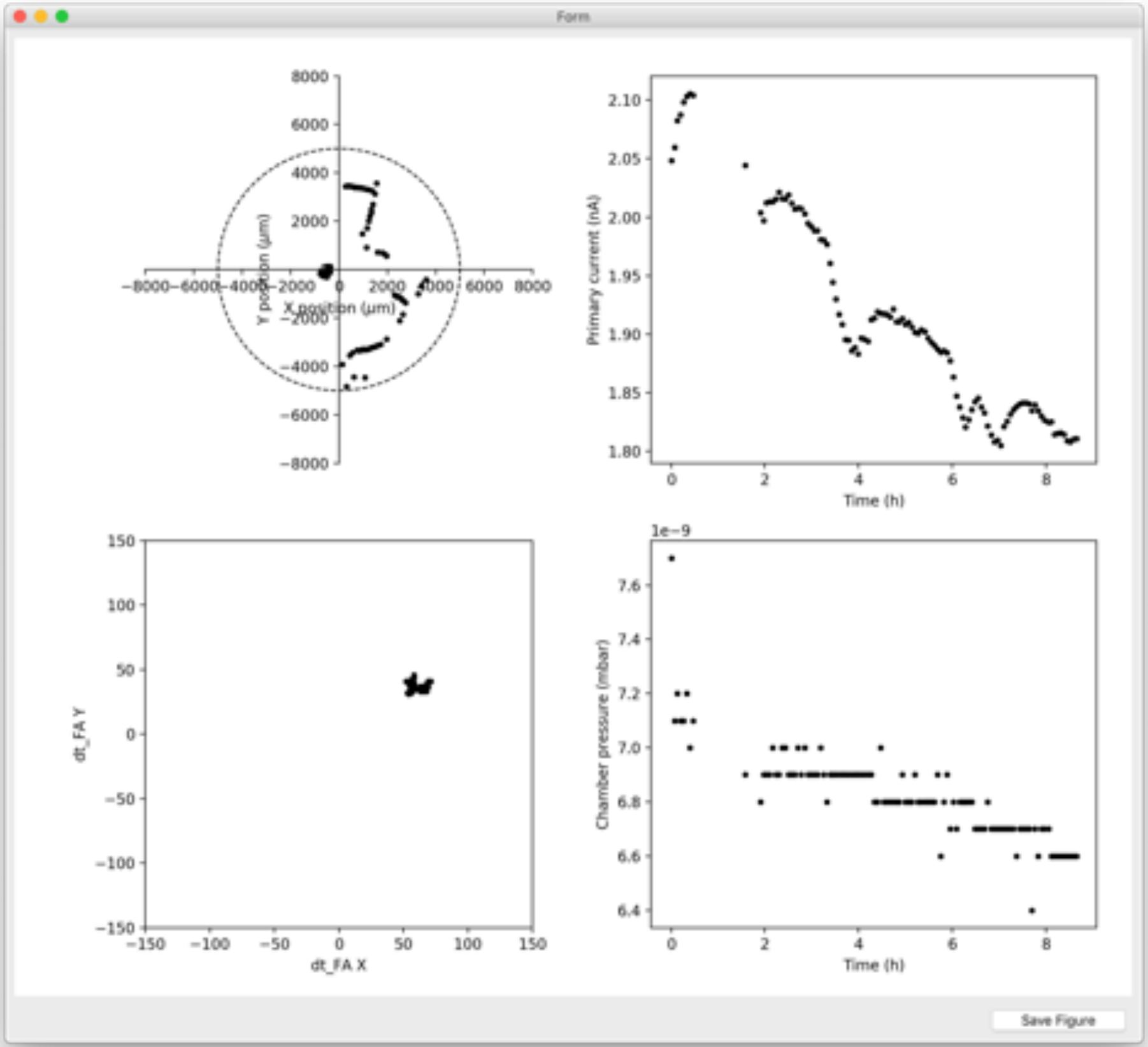


You can output the data by clicking in the menu bar: Output:
Standard data (only standard analyses)
Sample data (only unknown analyses)
Whole session (for unknowns and standards together)

It will create a .csv file
that can be directly
open in excel without further action.



Additional information about the conditions of measurements can be accessed by clicking in the menu bar: More : Sec. optics and primary



Similar actions can be done for concentration data, with up to 4 ratios and 4th polynomial order for drift correction.
Click on Concentration tab on the upper right corner of the main window (1)