

What *FitAll* Does

FitAll is a general-purpose, nonlinear regression analysis (curve fitting) program that can be used to fit a set of experimental data to any of the defined functions (models).

The 'best fit' is obtained by one of three methods:

- Linear Least Squares (lls): minimizes the sum of the squares of the deviations between the observed and calculated values of a function that is linear in its parameters.
- Nonlinear Least Squares (nlls): minimizes the sum of the squares of the deviations between the observed and calculated values.
- Nonlinear Least Absolute Deviations (nlad): minimizes the absolute deviations between the observed and calculated values.

FitAll is a tool to use in analyzing data that characterize all kinds of phenomena studied by scientists, engineers and students.

Some of the areas in which *FitAll* is being used are:

- biochemistry.
- biomedical research.
- cancer research.
- chemistry.
- corrosion.
- electrochemistry.
- enzymology.
- metallurgy.
- oceanography.
- pharmacology.
- petroleum research.
- reaction kinetics.
- semiconductor diode research.
- solar cell research.

FitAll fits data to continuous, single-valued:

functions with the general form:

$$Y_i = f(X_{ij}, K_k, P_p)$$

and

implicit functions with the general form:

$$Y_i = f(Y_i, X_{ij}, K_k, P_p)$$

in which:

- Y_i is the dependent variable (measured value of the function for the i^{th} data point).
- X_{ij} is the set of j independent variables for the i^{th} data point.
- K_k is a set of k constants that can be modified at runtime.
- P_p is the set of p parameters that are evaluated by *FitAll*.

FitAll can use weighting factors in the analysis.

FitAll has two methods (Boxcar and Fourier transform) for smoothing data.

FitAll reports the standard deviation of the overall fit and of each parameter that it resolves.

FitAll makes two-dimensional graphs of the:

- original data.
- calculated curve.
- residuals (that is, the difference between the actual and the calculated values).
- parameter sensitivities.
- residual distribution.

FitAll automatically scales the graphs for you or you can specify the axis limits and the number of tic-marks that should be used.

FitAll creates tables containing:

- the original data.
- the data and the corresponding calculated values.
- the resolved parameter values.
- the parameter sensitivities.
- the residual distribution.
- nonparametric statistics, such as, Kendall's tau.

All tables and graphs generated by **FitAll** can be:

- displayed on the computer's screen.
- copied to the Windows Clipboard.
- printed.
- sent or appended to **MS Word or MS Excel documents**.
- saved to disk as text or graphics files.