Residuals

In the context of least squares (or any other fitting method, e.g. MLE) the residuals are the difference between a model function and the experimental data. In least squares usually the weighted residuals trace is shown:

$$R_{wgt}(t_i)={{D\left(\mbox{model parameters},t_i\right)-D_i^{exp}} \over {w_i}}$$

$(D_i^{exp} | t_i)$ is the i-th data point of an experimental data set, $D\left(\mbox{model parameters},t_i\right)$ is the model equation at the observed points $t^{}_i$.

The weighting factor $w^{}_i$ describes the experimental uncertainty of each individual data point. For TCSPC data $w^{}_i$ is defined as

$$w_i=\sqrt{D_i^{exp}}$$

The resudials trace is of importance within any framework concerned with fitting, as the SymPhoTime software or FluoFit.

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