DTU Nutech
Center for Nuclear Technologies

Technical Note

Subject: New features in Risø TL/OSL software released Feb 2013

25-2-2013/TLAP

File format

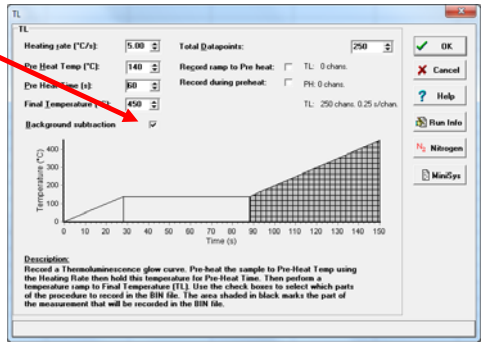
With the addition of new attachments and features to the reader, it has been necessary to change the change the format of the BIN file. The new format will be stored as files with the extension .binx to indicate that it has been extended. New versions of Viewer (V. 4.20 and higher) and Analyst (V.4.10 and higher) support this format. The new versions will also be able to deal with the .BIN format and even future updated versions of the .binx format (with loss of header information that may be added later).

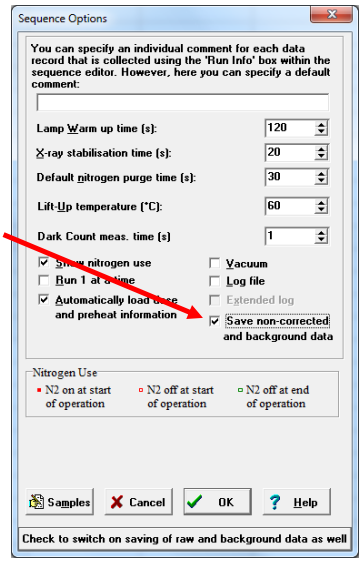
The version 3, 4 and 6 bin file format is documented in the "Sequence Editor" and "Viewer" manuals available on the home page www.osl.risoe.dk and in the *Manuals* folder after installation of the software. Version 5 has been used internally for a short period, and the new Analyst and Viewer versions will be able to read these files.

Sequence Editor V.4.20

Storage of background and uncorrected data

If you select "Save non-corrected and background data" in the sequence options, both non-corrected, background and corrected data will be stored if you choose background subtraction a TL command





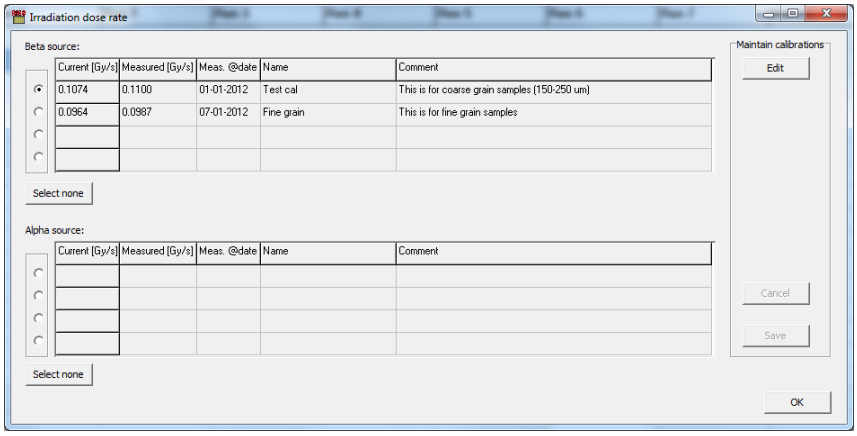
Corrected data will be stored as *CurveNo =0*, non-corrected as *CurveNo =1*, and background data as *CurveNo =2*.

CurveNo is a a parameter stored in the header which may be read with the *Viewer* and *Analyst* programs

Administration and use of irradiation dose rate calibrations

The TL/OSL reader will be used to estimate the dose that the samples have received after dose reset. In order to make the conversion to radiation dose, it is necessary to know the dose rate of the built-in source that is used in the measurement protocol. The irradiation dose rate will normally be established by a calibration procedure, and the calibration may vary with e.g. grain size and sample support.

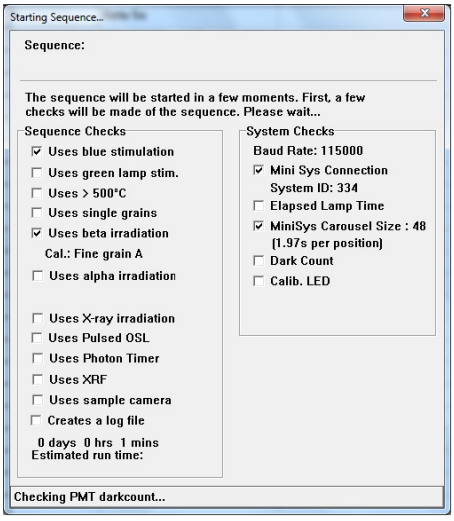
The Sequence Editor has been extended with an "Irradiation dose rate" form in the "Options" menu, where the calibrations may be typed in.



In the form you may select a beta- and/or alpha- dose rate calibration. When a measurement is done, the current dose rate and associated dose rate error, i.e. measured dose rate and dose rate error corrected for radioactive decay, is stored with the data in the bin-file. This enables Analyst to make a conversion of estimated dose from *equivalent seconds* (s) to *Grays* (Gy).

To type in or edit a calibration you press "Edit", and press "Save" when you are done.

When the sequence run starts, the setup form shows which irradiation sources are used in the sequence, and if beta and/or alpha sources are used, the name of the currently selected calibration is shown



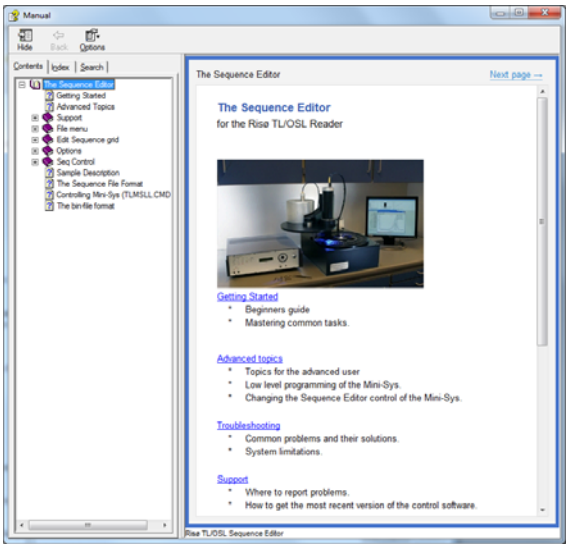
Support of new attachments

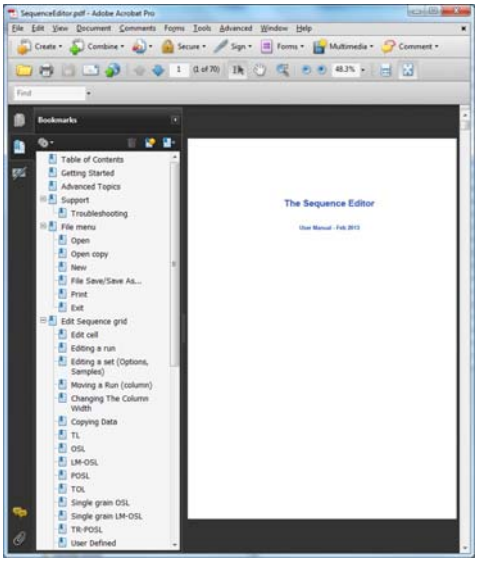
The Sequence Editor now supports the Sample Camera attachment. This means that if sample camera is selected in “System Options” then the “Options->Sample Camera Setup” appear and the “Photo” command may be selected for a cell in the sequence grid.

The Sequence Editor also supports a new model of Photon Timer board (TimeHarp 260). The model of Photon Timer board is selected in the “System Options” menu.

Updated help

The help function has been updated for all the Risø programs and changed to the compiled html type which is standard for later MS Windows version. The content of the Help file is now also available as a pdf manual for Sequence Editor and Viewer installed with the reader and available on the home page www.osl.risoe.dk

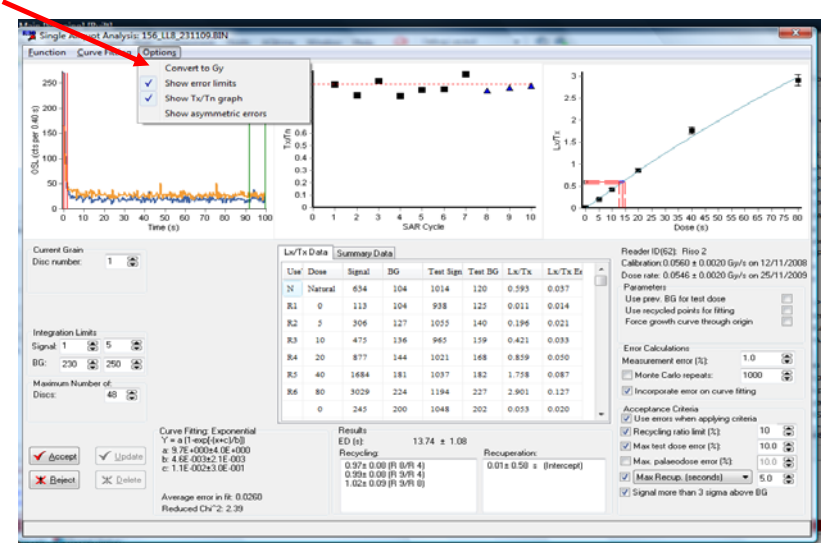




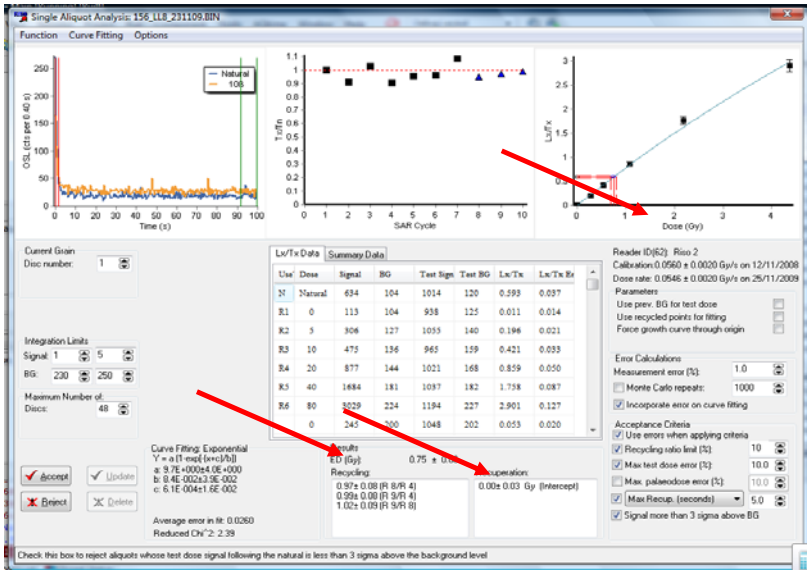
Analyst

Calculated dose in Gy

The user may select whether to work in seconds (default) or in Gy

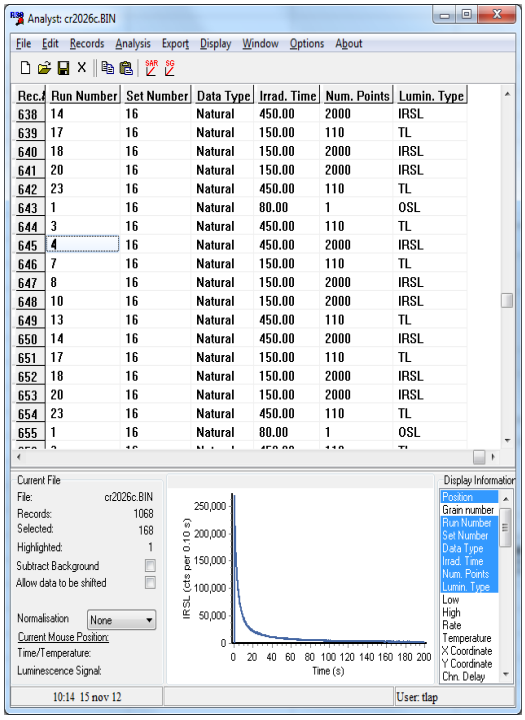


When “Convert to Gy” is selected, dose response curve and D_e are converted from seconds to Gy

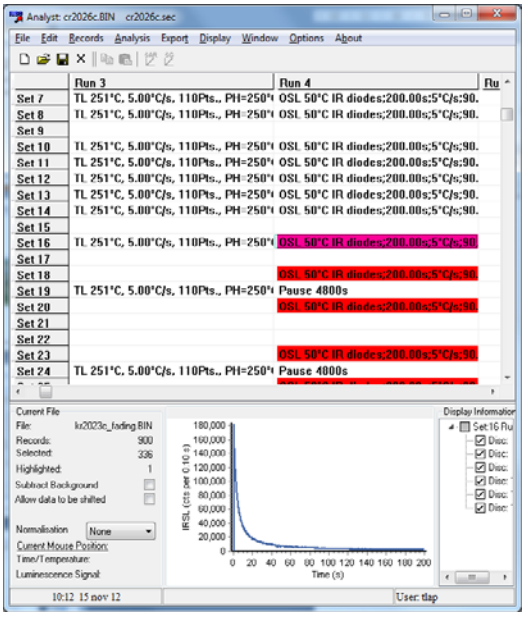


Sequence view

Now a “Sequence view” is introduced. In “Sequence view” the sequence that produced the data is shown and the selected data are highlighted as cells with a red background. You can switch freely between the “Classic view” and “Sequence view”



"Classic view"

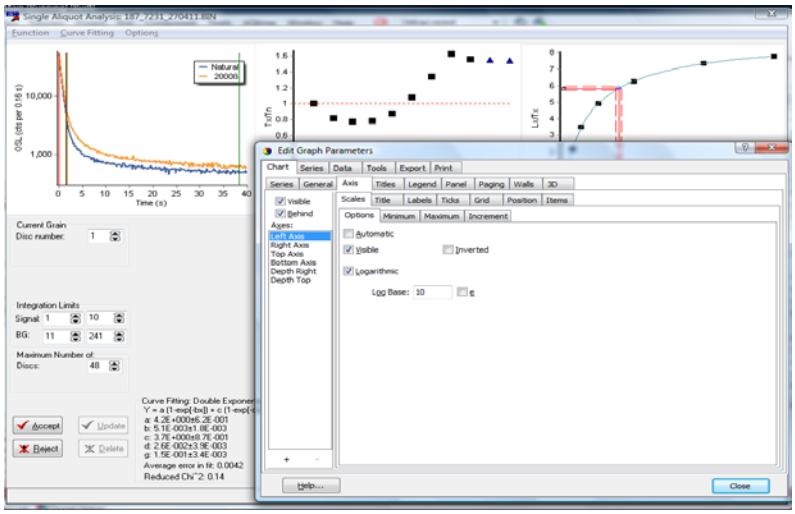


"Sequence view"

Customised graphs

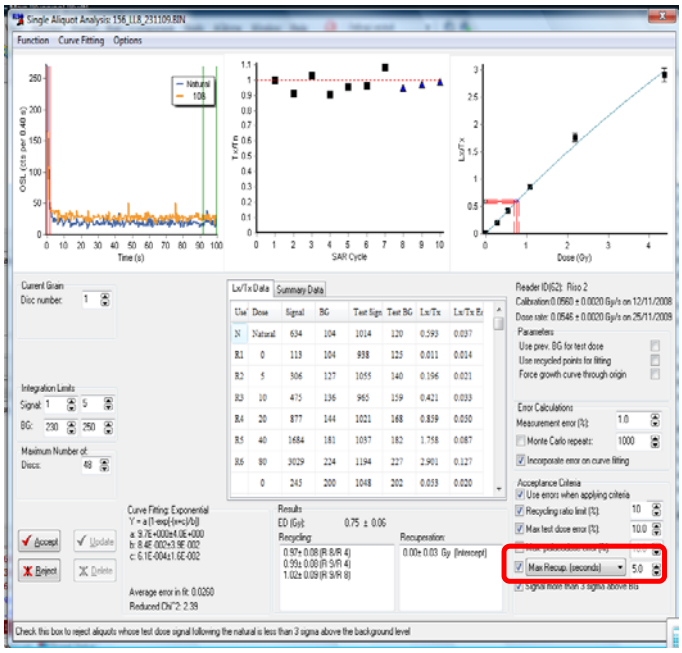
All graphs in Analyst can now be customised, e.g.:

- Log axes
- Font size
- Axis labels
- Symbol size
- Line thickness



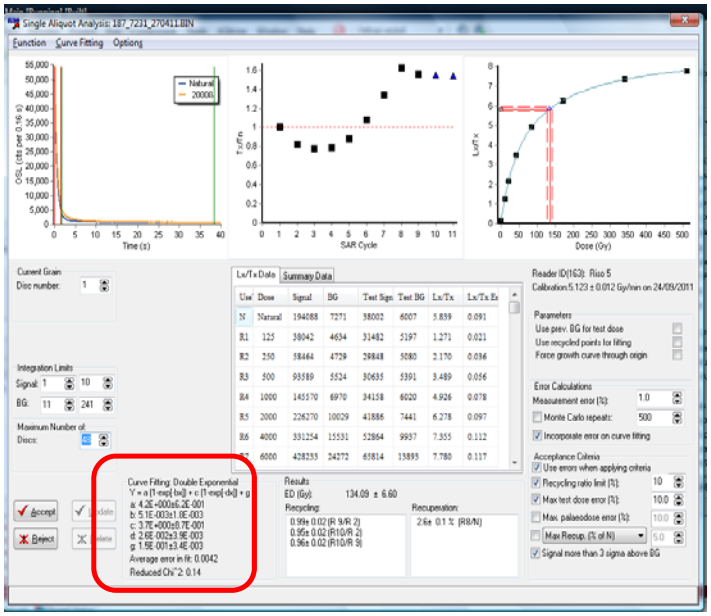
Recuperation acceptance criteria

New Acceptance criteria based on recuperation (uses the zero dose point) has been added. The criteria may be specified as % of Nat, % of signal from largest dose, or as an absolute value in Gy or secs



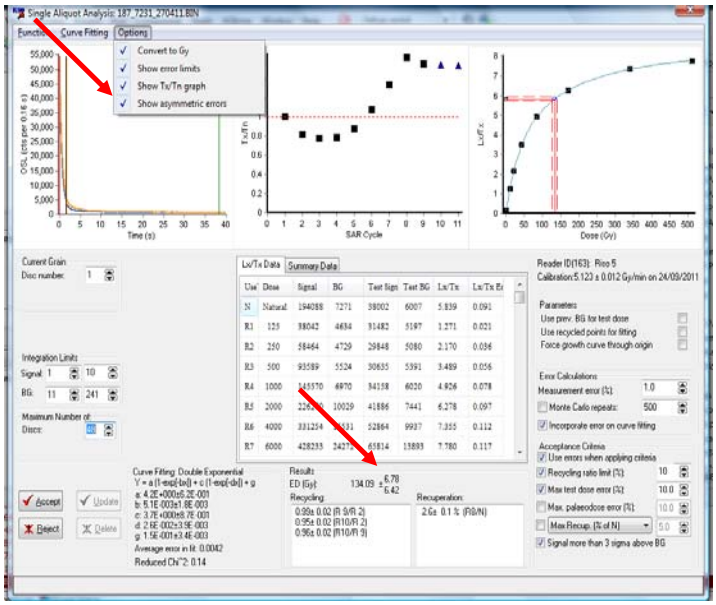
Double exponential fit

Single *Exponential* curve fitting is not OK for some samples, such as the one shown below. Now *Double Exponential* curve fitting is made available



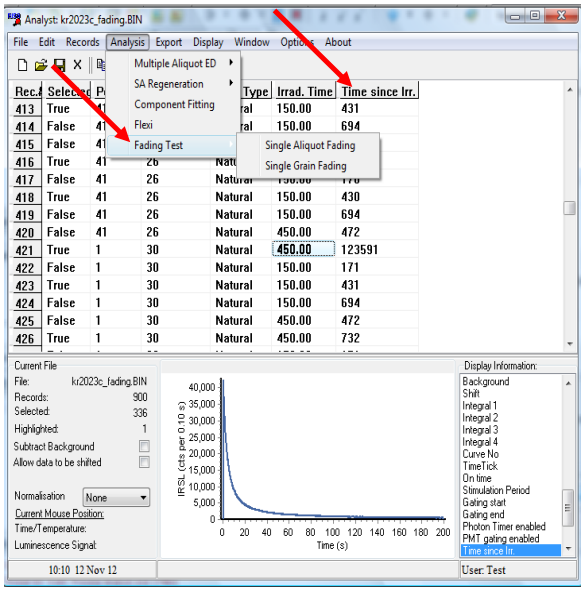
Show asymmetric errors

It is now possible to show asymmetric errors, but currently these are NOT propagated through when combining D_e values



Fading test

Fading test and estimation of fading rate is now made possible. You select the relevant data as you do for the SAR procedure and press “Fading test -> Single Aliquot Fading/ Single Grain Fading”



The time between start of irradiation and start of measurement is automatically recorded in the bin-file. This time is compensated for the duration of the irradiation to give t* (Aitken (1985), Appendix F, p. 280)

$$t^* = \frac{1}{e}\frac{t_2^{\frac{t_2}{t_2-t_1}}}{t_1^{\frac{t_1}{t_2-t_1}}}$$

where t_2 is the time since start of irradiation and t_1 is the time since end of irradiation .

From this the fading rate g (in %/decade based on t_0= 48 hours) is estimated.