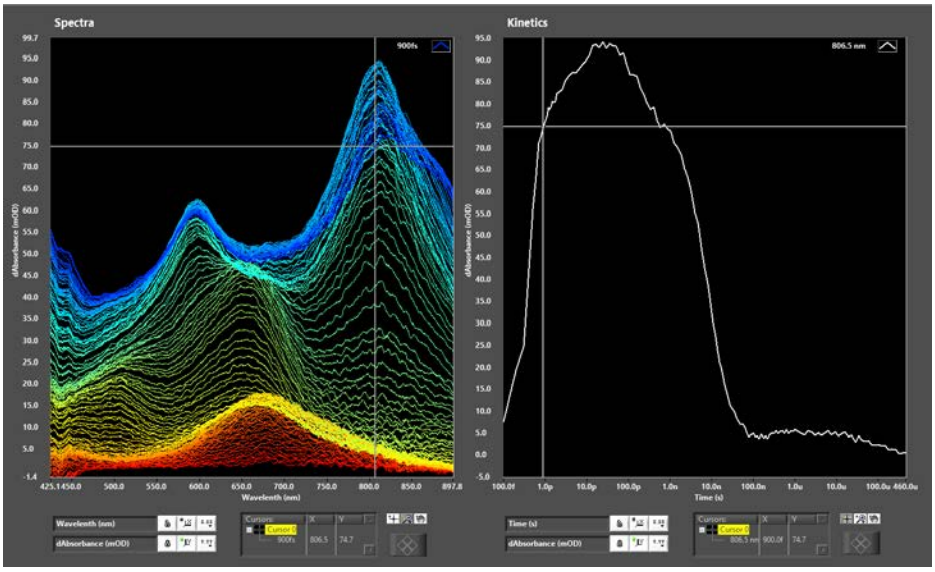
FEMTOSUITE

SOFTWARE MODULE FOR KINETIC AND SPECTRAL DATA ANALYSIS
/datasheet/

- *Easy navigation through transient spectra and kinetics*

The advanced data analysis software FemtoSuite module is capable of various types of data processing including global analysis. With its broad spectral coverage from UV to NIR and the time window of up to 10ms, produces spectral and kinetic data with excellent quality, needed for your investigations of photoinduced phenomena with picosecond time resolution. Different scientific interests and fields of applications require a variety of options and configurations. Thus, our data analysis software is designed for easy and intuitive navigation through different spectral and kinetic information.



Data Viewer Panel in FemtoSuite

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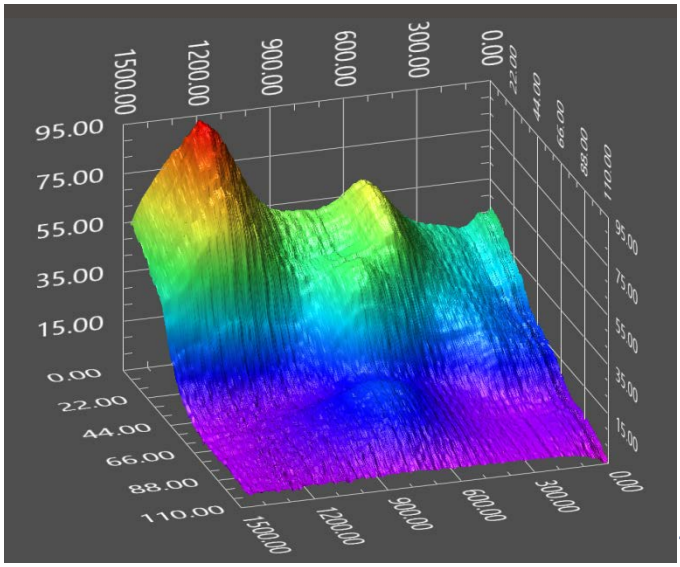
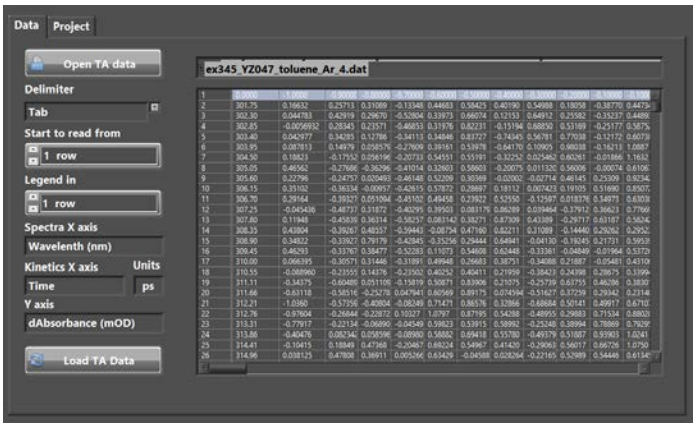


The 3D Surface report window

- *Load data in various formats and save the project.*

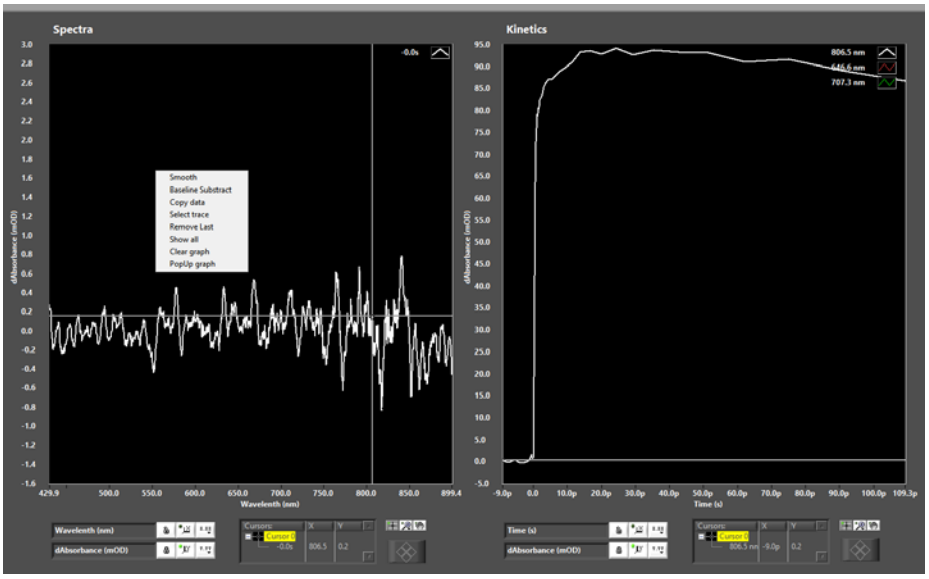
The software allows to save the transient absorption data as a project file. This is useful when you want to continue the analyses of the processed raw data. For example, after you have applied chirp correction on the data, spectral smoothing or if you want to test different kinetic model.



Load data window.

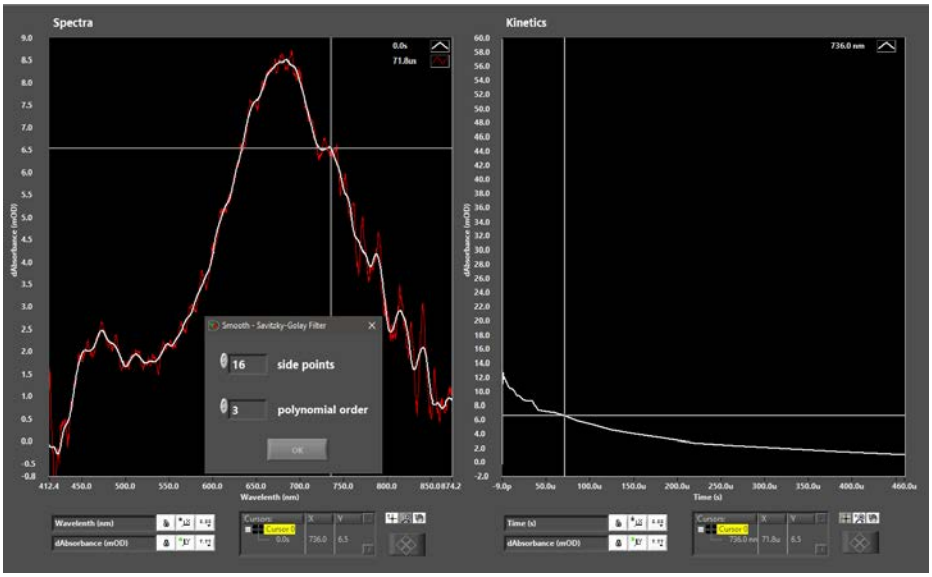
- *Background Subtraction*

Some data files may have a non-zero spectral baseline, which appears throughout the whole data set even before t_0. Such background is usually a result of excitation light scattering, stray light or signal from long-lived species present in the sample (species with lifetimes longer or on the order of the temporal interval between the laser pulses). Additionally such background may be a result of thermal lensing caused by the excitation beam. Femtosuite have an option for background subtraction. You can use the Spectra to Average option to add as many spectra as needed to produce an averaged background spectrum which will be automatically subtracted from the original data.



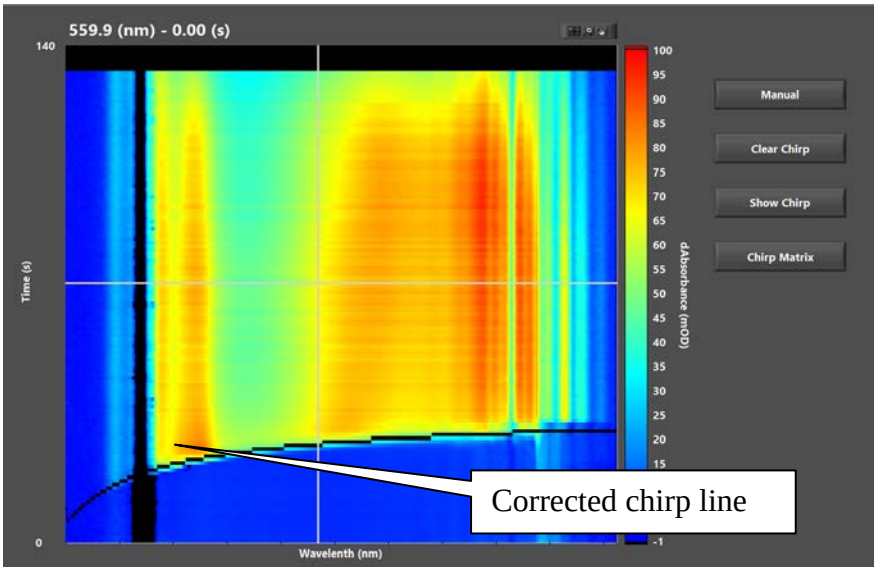
➢ *Spectral Smoothing with Savitsky-Golay filter*

Use this function to impose a median filtering over the spectra. Such filter is useful when there is "hi-frequency" noise over the spectra.



➢ *Temporal chirp corrections*

This function allows you to correct the 2D data matrix for the chirp of the probe pulse. To perform this function you need to have a file with tabulated dependence of the time zero from the wavelength, for example of the solvent response (see Fit Solvent Response). In many cases the t_0 vs. wavelength can be obtained also from the fitting of the sample data (see Fit Sample Kinetics).



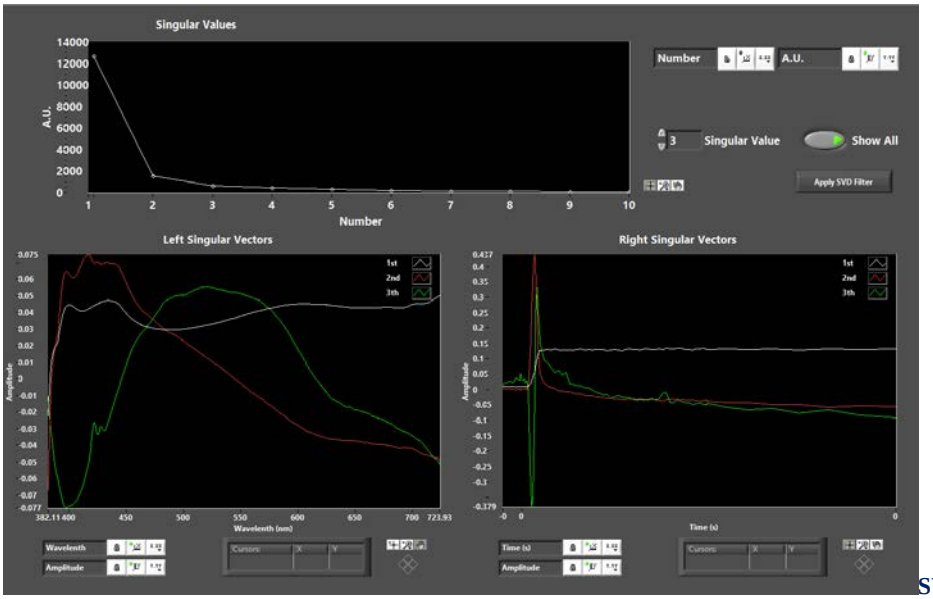
2D matrix graph with chirp corrected data

- *Time zero correction*

Time zero correction is implemented in the chirp correction. After the chirp correction the time axis isshifted to real time zero position.

- *Principal Components via SVD*

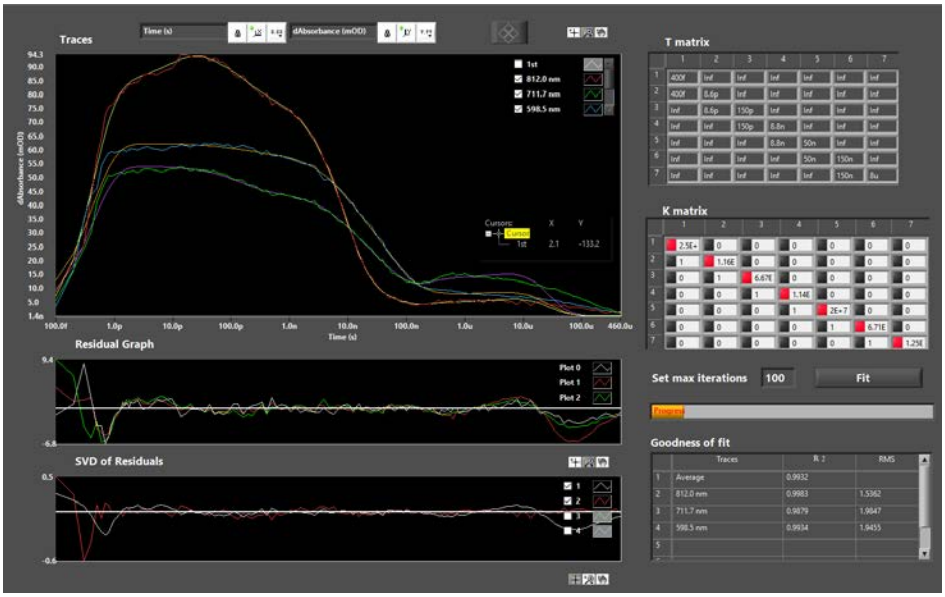
This function implements the singular value decomposition procedure for the 3D data matrix. The procedure decomposes TA matrix to product of three matrixes. The rows of the first matrix contain left singular vectors and the rows of the last matrix contain the right singular vectors. Middle matrix contain singular values. From the magnitude of the singular values the effective rank of the TA matrix can be justified. This gives the number of components of the system. Right singular vectors represent kinetic profiles of the components and can be used for the kinetic model fit.



SVD window.

➢ *Global Analysis*

This feature allows you to perform Global Fitting of your transient data.



View of the Global Fit window after fitting.

The process of Global Analysis consists of the following steps:

1. The A(λ,t) data matrix is corrected for the chirp of the super-continuum probe pulse.
2. The time zero is adjusted for the real time zero using the coherent signal from the solvent.
3. The resulting matrix is decomposed into its principal spectral and kinetic components via SVD (singular value decomposition).
4. The selected principal kinetic traces are globally fitted to a multi-exponential decays convoluted with the Gaussian instrument response function using the nonlinear Levenberg-Marquardt algorithm.
5. The pre-exponential coefficients as functions of the wavelength are calculated by the linear fit of the data obtained after step 1 to the exponentials obtained in step 3.

Finally, our software module provides high usability and user friendly software for automatic control of the detectors, spectrograph, as well as the data collection and data display

	FemtoSuite Data Presentation and Analysis Module, Features: • Spectral data smoothing with Savitsky-Golay filter • Spectra and kinetic trace conversion and export in ascii file format • 3D presentation of data • Temporal chirp correction • SVD singular Value Decomposition analysis • Single and global kinetic trace fitting with superposition of Exponentials and Gaussians • Fast navigation through transient spectra and kinetics • Comprehensive report generation • Compatible with Microsoft Windows XP/Vista/Win7/Win8/Win10	**1**