What is new in UNIFIT 2008

The version 2008 improves consequently the complete data processing from the measurement up to the presentation. New or improved subroutines enable the user to perform

i) presentation of parameter plots,

ii) export of graphics and tables in the JPG format (600dpi),

iii) redesign of the submenu during the quantification procedure,

iv) adjusted scaling of the residual function,

v) Fermi-Edge determination by means of a Theta-Gaussian convolution approach,

vi) implementation of new measurement formats.

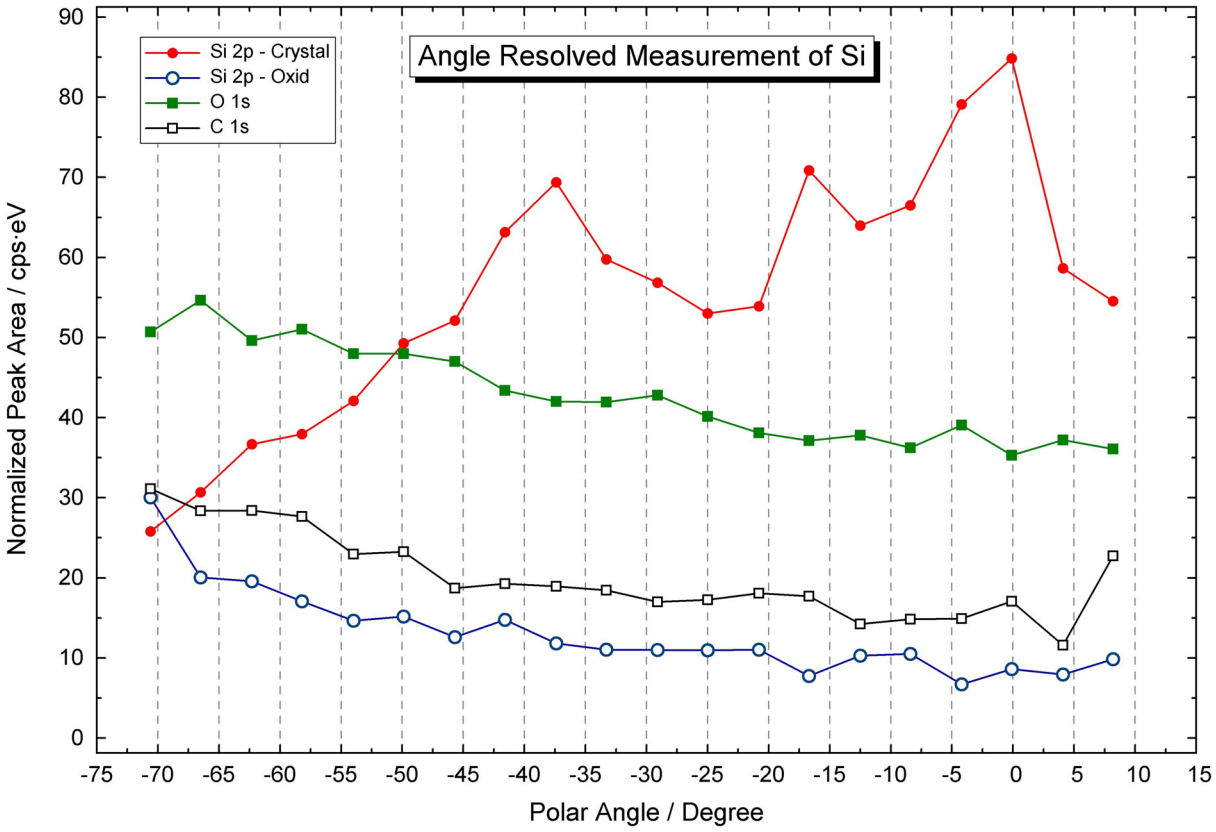

Fig. 1. Parameter plot graphic of an angle resolved measurement of oxidized Si created using UNIFIT 2008, exported as JPG, and inserted into this Word document

i) A parameter plot presenting the peak areas or atomic fractions with respect to a series parameter (e.g. sputter time or polar angle) was incorporated into the program. This new routine allows the presentation of data saved in a parameter dependent measurement format as well as data stored in a normal measurement format (with external parameter informations). Figure 1 shows the normalized peak areas of Si 2p (Si and SiO_2), C 1s and O 1s of an angle resolved measurement of naturally oxidized Silicon. Extensive graphical tools permit to design the created parameter plots. A snap shot of the parameter-plot dialog for setting the shape, thickness and colour of the parameter curves of the monitor is presented at Figure 2.

Additionally, a legend for describing the plotted curves may be inserted into the standard spectra and the parameter plots. The editing of the series parameters is realized using two separate subprograms.

ii) In addition to the BMP format the graphics and quantification tables may be exported as JPG format. The maximum resolution is 600 dpi. The required memory is clearly reduced.

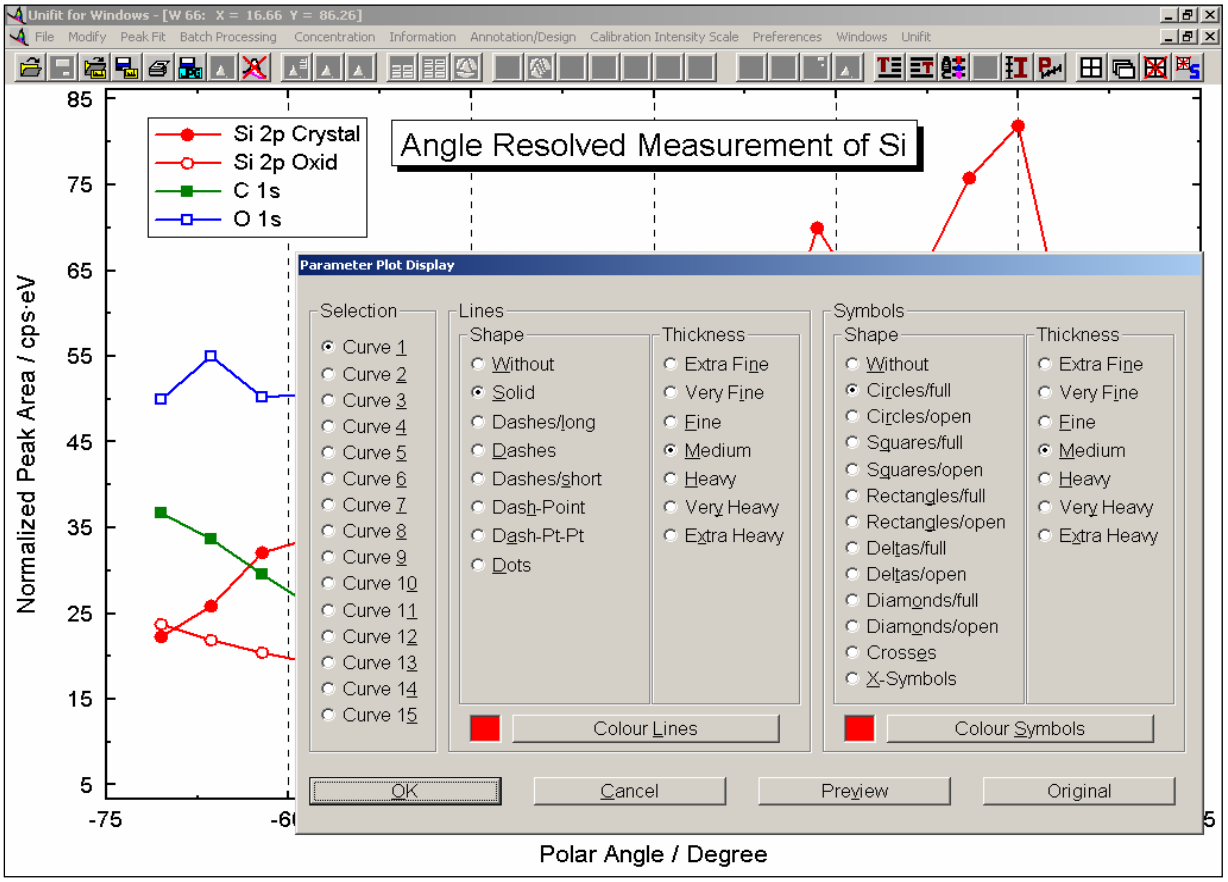

Fig. 2. Dialog for setting the colour, shape and thickness of the 15 graphs (line and symbols) of the parameter plot

iii) In order to provide all necessary options for quantification a new submenu was created (see Fig. 3). The quantification result can be saved together with the project. The quantification table is opened automatically when a project is loaded.

iv) The scaling of the intensity axis of the residual function is adjusted and shown for every case independent from maximum and minimum values.

v) The Fermi edge can be determined convoluting a Theta function $\Theta(E)$ and a Gaussian function $G(E)$ giving $[f(E) = \Theta(E)*G(E)]$ for fitting of the measured edge spectra. The procedure is demonstrated together with the traditional linear approximation in Fig. 4 using a synthetic test spectrum generated with the Fermi edge E_F =3.275 eV (jumping point of $\Theta(E)$) , a Gaussian peak with $FWHM$= 2.6 eV, and a normally distributed statistical noise.

vi) The individual measurement formats VGS2000 (University of Giessen) and SES2002 (Research Centre of Karlsruhe) were implemented.

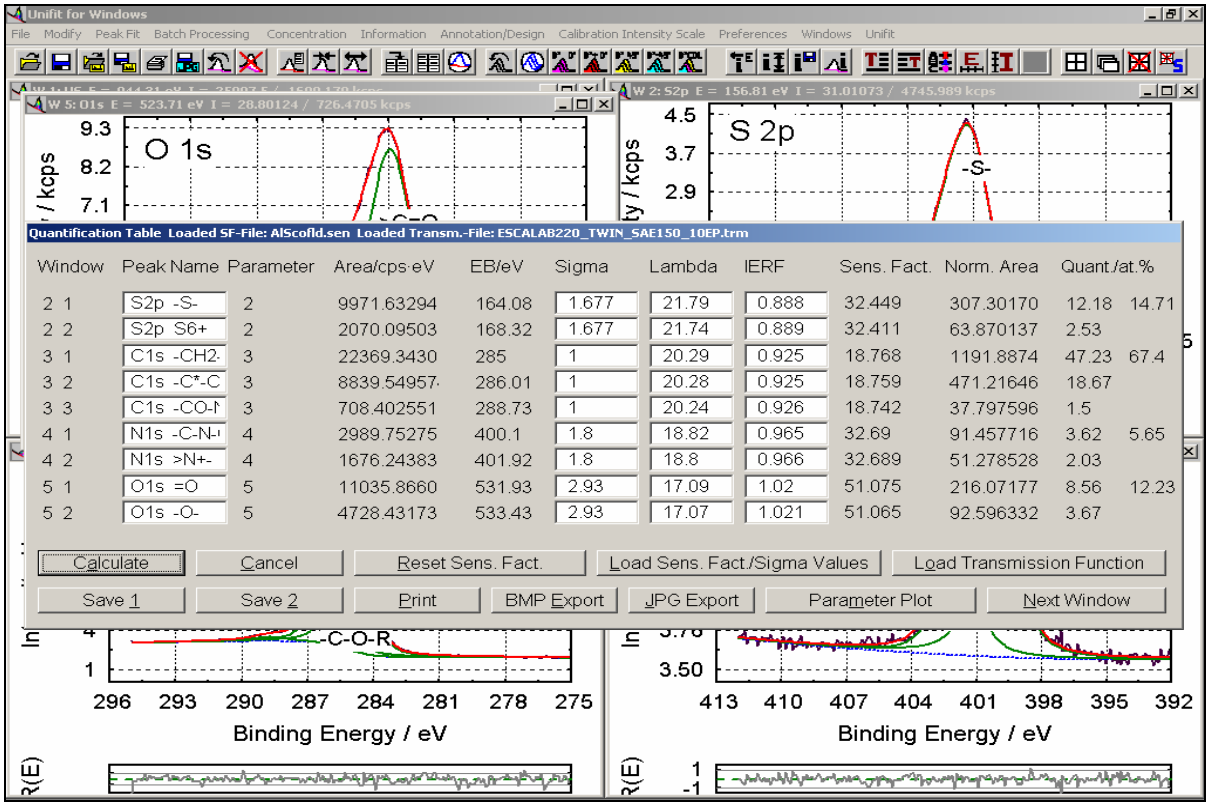

Fig. 3. Redesigned dialog of the quantification, the snap shot shows the example of sulphur, carbon, oxygen, and nitrogen using the sensitivity factor defined by the product of σ, λ and the transmission function $T(E)$ introduced by *IERF*.

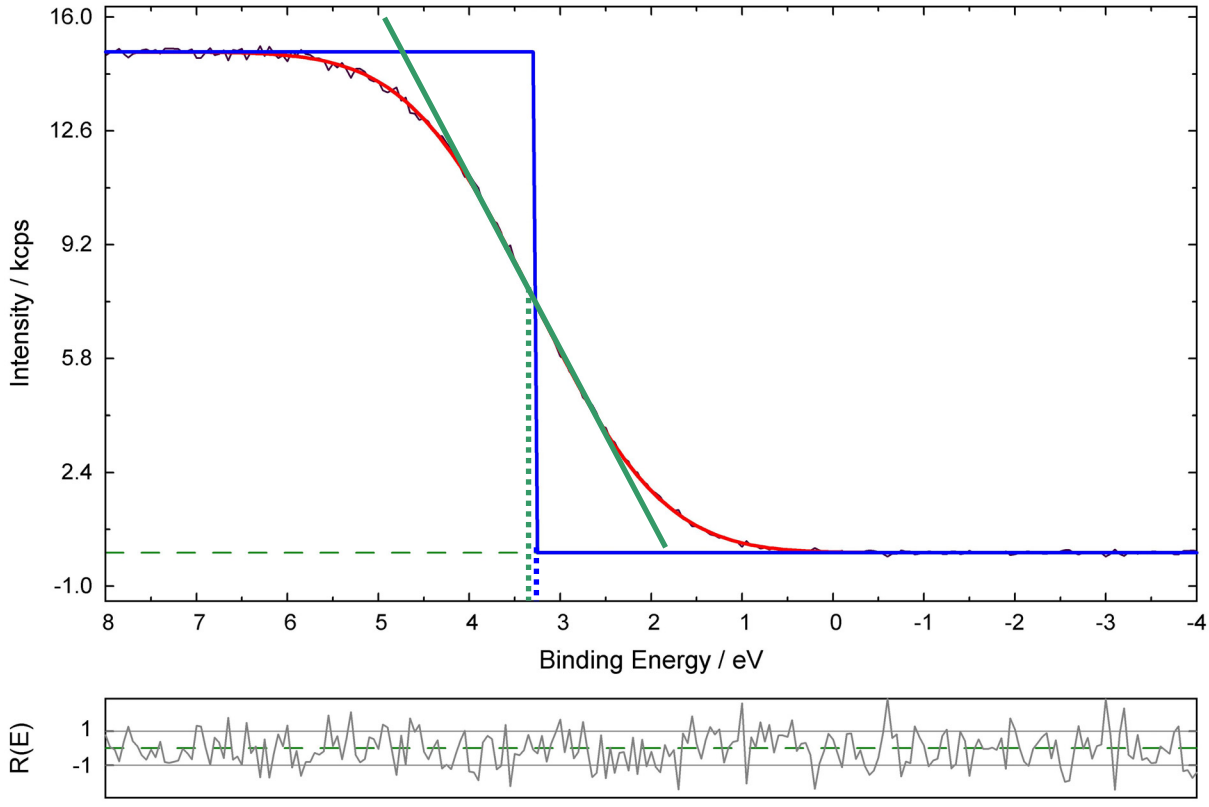

Fig. 4. Estimated Fermi edge, green: linear approximation, E_F = 3.35 eV, blue: Theta function, E_F = 3.27 eV, red: convolution function with Gaussian *FWHM* = 2.59 eV