Spectrum aquizition and analysis

You can acquire spectra either using the instructions specified in the parameter sets or manually independently from those. However, spectra analysis and saving of unevaluated spectra data is only possible in LVis using previously defined parameter sets. Spectrum, parameter set and possibly analysis results are saved together with the calibration and library used in a measurement, an `.LVM` file.

Start parameterized measurements

To start spectra acquisition using settings defined in a parameter set, `right-click` on the parameter set and select *Start parameterized measurement*.

IMAGE MISSING

This will open the parameter set window, displaying the current preset sample, measurement, and analysis settings. If you wish, you can add sample-specific parameters to the unlocked fields (see Login and Logoff), e.g., sample name, additional information, sample weight, etc.

IMAGE MISSING

When all information has been entered, start data acquisition by clicking the *Start* button. If the memory content of the electronic measuring equipment has not been displayed yet on the desktop (See Detectors → Show), then it will now be automatically opened as an active window.

As soon as the measurement is running, the currently performed measurement by this detector and the parameter set used in this measurement are displayed in the configuration tree next to the respective detector as well as in the header of the spectra view.

If a measuring time is specified, then the already elapsed time is displayed in percentage in the configuration window next to the detector. If no fixed measuring time is specified (enter *0* [zero] in the measuring time field), then the measurement must be completed manually and the elapsed time will be displayed next to the detector.

IMAGE MISSING

Manual Spectrum Acquisition

LVis allows you to acquire spectra manually, without the need for defining a parameter set. To do this, `right-click` on the desired detector in the configuration bar, and select *Start spectra acquisition*. Alternatively, if the detector's spectrum window is already open on the desktop, you can start and stop acquisition with the respective tool bar buttons. You can also continue a previously stopped spectra acquisition.

Note that you can continue a previously stopped measurement regardless of whether the spectrum was acquired manually or with a parameter set, and whether or not it has already been analyzed. More counts are simply added to the spectrum already in detector memory.

Stop/Delete Measurement — Stop Data Acquisition

Once started, a parameterized measurement can only be stopped via the context menu of the detector by choosing *Clear active parameters*. In addition to aborting data collection, the reference between parameter set and data acquisition will be deleted.

IMAGE MISSING

The *Start* and *Stop* icons in the tool bar can only be used to start and stop a simple manual spectrum acquisition without reference to a parameter set. They cannot be used to stop a parameterized measurement.

You can stop a parameterized measurement by selecting *Evaluation* and then *Reject* in the subsequently displayed window. You must confirm whether the measurement should be canceled.

Analyze Measurements and Create Reports

A spectrum analysis in *LVis* contains of several automatically executed steps. On the one hand, the spectrum is transferred to GammaVision according to the settings defined in the parameter set (and global LVis settings), where it is respectively evaluated. The analysis results achieved are graphically presented in tabular form and can be used for the creation of a report or a .PBC file for the background correction.

In addition, a simple mathematical peak search takes place. This basically corresponds to a *GammaVision WAN32* analysis without library, hence to a pure *Mariscotti* peak search. The results of the peaks found in this peak search are entered into the analysis database as well and are later on compared to the analysis library specified in the parameter set.

Besides actual analysis and peak search, *LVis* also saves library and calibration files used in the analysis internally in the measurement (`.LVM` file) and shows the content on a separate Calibration/ Library tab. This allows repeating the analysis even years later using the previously valid parameters without creating a safety copy of each individual file.

Based on a measurement, an intermediate analysis can be performed during data acquisition (e.g., to check, whether the required limit of detection has been reached) or an analysis can be run after the specified measuring time is elapsed. An intermediate evaluation must always be started manually; a final evaluation can be started automatically.

In order to automatically analyze a measurement and to export a report after the measuring time is elapsed, the checkmark in the *Automatic analysis and report* in the Parameter Sets must be set and a report template must be marked on the selection box located underneath.

IMAGE MISSING

An intermediate analysis (or a manual final analysis) can be started by selecting *Analyze measurement* either from the configuration bar via the context menu of the respective detector or for a currently active detector, via the respective icon in the tool bar.

Analyze measurement combines the analysis settings specified in the parameter set with spectrum, calibration and library in one unit.

Thus, after selection of *Analyze current spectrum*, first a window is displayed, which, except for two additional tabs (Spectrum and Calibration/Library), is identical to the window for the selected parameter set. The associated Spectrum tab displays the spectrum that was available when *Analyze current spectrum* was selected.

IMAGE MISSING

The display options (zoom, linear-logarithmic y-axis, line, bar or point presentation, etc.) are identical to the options of Spectra windows on the desktop. In addition, the detector used for spectrum acquisition is shown in the upper left of the spectra window.

`Clicking` on *GammaVision* transfers the spectrum, including all analysis parameters, to GammaVision. This can be useful if you would like to use options not directly supported by LVis. Furthermore, it is possible to export into the simple *ORTEC* `.CHN` spectra format and to review the spectrum using the *GVPlot* spectra viewer in detail. The display of peak fits is not supported at this point, but only after an analysis.

If you have not defined a measuring time or a pre-set measuring time has not been reached yet, the data acquisition will continue in the background and will not be affected by the intermediate analysis.

In the first two tabs of the window, you can find all important information regarding the current measurement to be analyzed. Here you can verify all analysis parameters once more. If all parameters are OK, start the analysis by clicking the *Analyze* button.

Analysis Results

After the analysis is completed, the measurement window is displayed along with three additional tabs, Analysis results, Peak search, and Calibration/Library.

IMAGE MISSING

The Analysis results tab contains two tables. The upper table contains a list of all nuclides listed in the library, plus the identified (decay-corrected) activity, the corresponding errors and the respective detection limit. If you click on one of the listed nuclides, the analysis results of all corresponding peaks are displaced in the lower table. All results of nuclides and peaks whose activity exceeds the detection limit are highlighted in red.

Tip
Compare the consistency of different peak activities of a nuclide. This will provide a good indication as to whether the analysis was meaningful or not.

By double-clicking on a peak entry in the lower table, you can reach the respective position in the spectrum and have the peak fit displayed.

After a spectrum analysis has been completed, it is possible to select different fit display options in the right menu of the spectrum tab.

All displays identified and unidentified peak fits; *Ident* only shows identified and *n. Id.* only the unidentified peaks.

IMAGE MISSING

Using the arrow keys **IMAGE MISSING**, you can move within the spectrum from peak to peak. Thereby the next peak of the respective, currently selected peak fit presentation is shown (e.g., moving from an unidentified peak to the next as well, if all unidentified peaks are currently displayed). It is as well possible to jump from peak to peak within the currently selected nuclide **IMAGE MISSING** . By using the up & down arrows one can switch from one nuclide to another and get all the respective peaks displayed.

Furthermore, you have the option to display basic fitting information of a peak in the spectrum by clicking on the *Info* button. As a result, information is automatically updated, if a different peak is

selected manually or by using the arrow keys.

Important
Arrow keys as well as the *Info* function are only functional if a peak fit display has been selected.

Now the analysis results can be used to create a report (see Create Report). Furthermore you can create a .PBC file for background correction based on the analysis results.

IMAGE MISSING

If have done an analysis of your measurement before the specified live time preset was reached (intermediate analysis) and you would like to continue the measurement (e.g., because the required limit of detection has not been reached), then select *Continue acquisition*.

Important
Only if you use *Continue measurement*, does *LVis* maintain the connection of used measurement parameters, assigned spectrum name, etc. with the current data acquisition of the detector. If you click on *Reject* or on the *Windows Close* icon (x) in the upper-right corner, the reference is lost and cannot be restored. Therefore always use *Continue measurement*.

Create Report

You can create an analysis results report for a measurement either by activating *Automatic analysis and report* in the parameter set or manually following a completed analysis by `clicking` on the *Print report* button in the Analysis results tab. In the latter case, you are first asked to select a report template in a selection menu. See also the Reports chapter.

IMAGE MISSING

As of this release, *LVis* has only one report template. All reports in LVis are based on *Crystal Reports* templates. You can either create these templates with *Crystal Reports* or we can work with you to create them. Contact your *ORTEC* representative or our Global Service Center. Existing report templates can be modified using the designer that comes with *LVis* (see Report Editor).

The reports are either displayed in a separate Crystal Reports viewer or if pdf reporting is activated in the Global Settings directly in your pdf viewer.

IMAGE MISSING

IMAGE MISSING

Tip
To save the report as a separate file or to process the measurement results in some form, use the Crystal Report Viewer export feature to export the data in a number of different file formats, including .PDF, *Microsoft Excel*, *Microsoft Word*, *HTML*, and comma-delimited text. To export a report, click on *Export file* in the upper left of the *Crystal Report* Viewer. This will display the following dialog, in which you can specify the export format:

IMAGE MISSING

Creation of a Background Correction Based on the Analysis Results

Peak Search Results

Internal Storage of Calibration and Library

Modifying the internal nuclide library of an LVis measurement file

Modifying the internal calibration of an LVis measurement file

Re-evaluate Existing Measurements

Approval of Measurements and Analysis Results

Using EFFTRAN with LVis

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