HyperLab 2005 Quick Start Guide for Main Module



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## About this document

For detailed instructions on using the installed Main Module, start reading this *Quick Start Guide*. If you did not install the Main Module yet, refer to *Installation Guide* first. If you want to get finer details about peak evaluation or other HyperLab processes, see the *Reference Guide*.

# 1. Introduction

This Quick Start Guide contains basic information on HyperLab system, including system overview, and usage instructions. It also details initial steps to fill up a sample database and to carry out most common spectroscopy tasks. We will guide you through a comprehensive tour, where a set of sample spectra will be processed by HyperLab system.

## 1.1. What is HyperLab?

HyperLab is a sophisticated software system, which is intended to greatly ease daily tasks of gamma spectroscopists and scientists with up-to-date techniques and algorithms. It uses novel techniques to reliably evaluate extremely complex gamma spectra taken with semiconductor detectors. Evaluation of Dual LFC (Loss Free Counting) gamma spectra is also supported. The software system is capable of determining your system's absolute or relative full-energy detector efficiency functions, as well as system nonlinearity function from multiple measurements taken with multiple sources. It is also capable of investigating the detector resolution versus energy function for arbitrary isotopes.

### 1.2. System architecture overview

HyperLab Main Module stores *all* spectroscopic information in relational databases. The next figure illustrates basic system components.

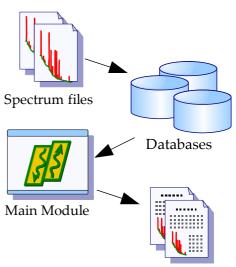
**Main module** is the application where you will operate various evaluation utilities (peak area evaluator, detector efficiency evaluator etc.) and also the primary interface to information stored in one or more **databases**. Benefits of database systems are described in *Reference Guide*.

### 1.3. Overview of HyperLab tasks

When a gamma spectroscopist starts using HyperLab, usually the following steps are performed:

- Creating one or more databases with Main Module. The new database is "empty" at this point (indeed, it contains nuclear data).
- Defining the measurement setup, and also custom projects. Projects in the database are similar to folders of hard disks, and helps to manage vast amount of information.
- Transferring of existing spectrum files into the database.
- Peak evaluation of spectra; possibly with defining modified energy and FWHM calibration.
- Exporting peak lists for outer evaluation applications.

The resulting peak lists may also be used to perform system *nonlinearity* evaluation, detector *efficiency* or *resolution* determination within Main Module. See *Reference Guide* for details.

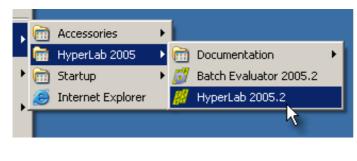


Report files

Information

**i**)

# 2. Getting Started with Main Module



ÖK

#### Start HyperLab Main Module by clicking on Start/ Programs/ HyperLab 2005/

HyperLab 2005.2 menu.

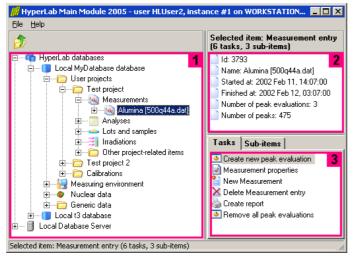
A message appears, which warns you X about missing databases. You can create a new database if you click 'Local Database Server', then pick a Press Ok.

Main Module window appears now.

### 2.1. The Main Module window

No databases are registered in HyperLab yet

task at the right named 'Create a database' Database creation will take about 5 minutes.



This window appears when Main Module is started. Its main parts are the following:

Database browser tree [1] provides hierarchic listing of objects stored in HyperLab databases. The items displayed in this tree are called *nodes*.

**Detail lister** [2] shows common details for the item which is currently selected in the browser tree.

Tasks and Sub-items panels [3] are

refreshing their content according to the data entry you have selected in the database browser tree. *Tasks* provides you operations which may be performed on the selected database entry; whereas Sub-items shows special sub-components about it.

Content of the *Tasks* window also appears in a **context menu**, when user right-clicks on a database node.

Common keyboard shortcuts may help your work: database tree may be walked through by using the *cursor arrow* keys, while the currently selected task may be started by hitting the *Enter* key. *Tab* key switches between the browser tree and the *Tasks* window.

## 3. Creating a new HyperLab database

In most cases, the next step is to create a new local database. First check if your local MSDE database service is running: the familiar green triangle should be displayed on your system tray. Starting with version 2005, HyperLab is able to use a remote database, that is, to transfer the evaluation data through the computer network from another user's database. In this case, no local database or database server installation is required, just a registration of the remote database. See *Reference Guide* for details.

🐰 Creating a HyperLab database

#### 3.1. Database creation

Click *Local database server* node, then on the task *Create a database*.

Database creating wizard appears now. Enter login name **sa** and password **hlpwd2005** for the database administrator. This is required because the database access is password protected.

When you are ready, click Next.

Specify the name of the new database, then click Next.

🚜 Creating a HyperLab database	_ 🗆 🗙
Specify login name and password for the local database server, then click Next.	
MSSQL jogin name: sa MSSQL password: <sup>samanasan</sup>	
unade Fernung 1	
< Back Next > Close	

New database name:	HyperLab1		
Location of new database:	C:\Documents and Settings\HLUser3\My Documents\HyperLab\		
Existing databases:			
Initialization data			
Basic data file:	C:\Documents and Settings\HLUser3\My Documents\HyperLab\ 💋		
Nuclear data file:	C:\Documents and Settings\HLUser3\My Documents\HyperLab\		

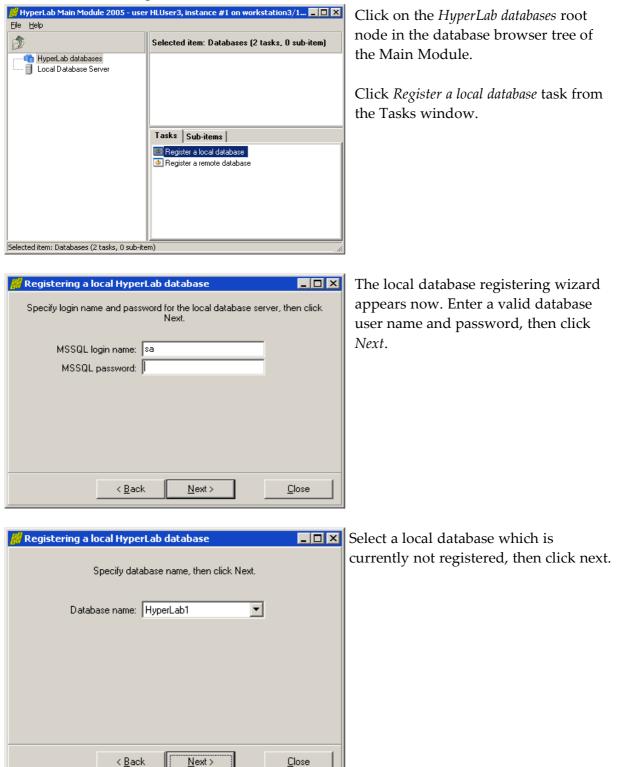
- 🗆 ×

An automatic database creation process is started, which also incorporates the copying of large amount of nuclear data. The process may take several minutes. When the copying process ends, click Finish.

Creating a HyperLab database	
Database successfully created at the local database server. Click Finish to close wizard.	
Messages:	
Documents\HyperLab\Databases\HyperLab1.mdl' created successfully *** Database HyperLab1 successfully opened *** Creating databases tables *** Tables successfully opened *** Insetting basic data records *** Basic data records *** Deening nuclear data records *** Thousen data records *** Taules data records *** Taules data records *** Nuclear data records successfully inserted	
< Back Next>	

#### 3.2. Database registration

When you create a new HyperLab database, MSDE database server will be its owner. However, HyperLab will not be aware of this new database without *registering* it. During registration, a simple entry created in a text file, which will direct HyperLab to display the database in the Main Module's database browser tree, under 'HyperLab databases' node. In order to register a newly created local database, follow the steps detailed below.



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If the selected database is accessible on the local database server, then you can specify a description for the database. This description will be displayed in Main Module's database browser tree, under *HyperLab databases* node.

Also some attributes of the local database server is displayed.

When you are ready, click Finish.

🎇 Registering a local HyperLab database 🛛 📃 🗵 🗙				
Local database successfully connected. Please change its description, if needed, then click Finish to register it.				
Description: HyperLab1 database on local machine				
Additional info:				
Database name: HyperLab1 Database server: WORKSTATION3 Database server version: 8.00.760 Database server level: SP3 Database server edition: Desktop Engine Database server collation: SQL_Latin1_General_CP1_CI_AS				
< <u>B</u> ack <u>N</u> ext > <u>Finish</u>				

## 4. Using databases

If you start Main Module, it will display the newly created database now.

Click on the [+] sign beside the database to start working with it.

Alternatively, you can hit the *Enter* key, which starts the task which is selected on the right – in this case, the database opening task.

🖁 HyperLab Main Module 2005 - user HLUser3, instance #1 on workstation3/1 💶 🗖 🗙			
Eile Help			
۵	Selected item: Database (2 tasks, 0 sub-item)		
TyperLab databases     TyperLab I database on local machine     Local Database Server	Description: HyperLab1 database on local ma Server name: (local machine) Database name: HyperLab1 Status: not opened <b>Tasks Sub-items</b> Open database Unregister this database		
Selected item: Database (2 tasks, 0 sub-item)			

Specify the database user name and password, then click *OK*.

D	atabase Login		×
	Database:	Local_HyperLab1_database	
	<u>U</u> ser Name: <u>P</u> assword:	29 29	
		<u>D</u> K Cancel	

#### Using databases

HyperLab databases     HyperLab1 database on local machine     HyperLab1 database on local machine	Selected item: Database (3 tasks, 0 sub-item) Description: HyperLab1 database on local ma Server name: (local machine) Database name: HyperLab1 Status: opened
HyperLab1 database on local machine     HyperLab1 database on local machine     Holesr projects     Holesr data     Holesr data     Holesr data	Server name: (local machine) Database name: HyperLab1 Status: opened
	Database version: 2005.2 Number of users logged in: 1 Database file:: Data file, 25600 KB, C:\Docu Database file:: Log file, 6400 KB, C:\Docume <b>Tasks Sub-items</b> Create report Dygrade database Repair database

Usual database browser tree displayed at the left, with database details displayed at the top right, while the possible operations listed in the Tasks window.

Now you should create a new project for HyperLab sample spectra. Click on *User projects*, and on the task "*New project*".

Alternatively, you can use your keyboard: the *arrow keys* can be used to quickly navigate within the database tree, and *Enter* key starts the currently

selected task. The *Tab* key switches between the Tasks and the Database tree window.

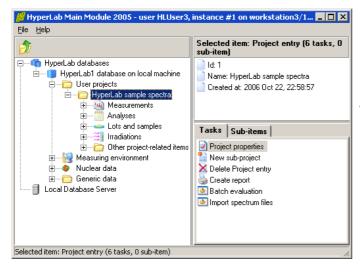
	Project properties			J ×
	Selected project - pg 1 More pr	ject entries		
	PROJECT ID			
	NAME		_	
	START DATE	2006 Aug 11 🔽 04:36:17 🕂 234 msec 🥝		
	FINISH DATE	2006 Aug 11 🔽 04:36:17 🕂 265 msec 🥑		
	OWNER PROJECT		💌 📝 🔛	0
	STORED BY	Database administrator		
	STORED AT	2006 Aug 11, 04:36:17		
	COMMENT		_	
				_
		∂ Help OK Cancel	冠 Apply	
Γ				_

Now a database entry – or *record* - editor window appears. In this case the details of a new project record may be specified.

Different window belongs to each kind of database entry, but their basic building blocks are very similar.

For detailed description of record editor pages, see the *Reference Guide*.

Now type a project name, say "HyperLab sample spectra", then click the OK button. Alternatively, you can hit the *Enter* key. *Tab* key will cycle through database editor fields.



A new user project appears in the database browser tree. Open it, and click on *Measurements* node, then initiate the *Import spectrum files* task: simply click on it once in the Tasks window.

## 5. Importing spectrum files

As Main Module stores also the count information in databases, you should import your spectrum files to the database in order to evaluate them. Click a project's *Measurements* node, and then select the *Import spectrum files* task. A spectrum file importer window appears now.

Click on *Add file...* button to select HyperLab sample spectrum files.

🔏 Spectrum file importer 📃				
Select spectrum files to be loaded, adjust load settings, then press 'Load files' button.				
Spectrum files Main settings Calibrations Sample Advanced				
# Spectrum type File name File folder				
🕂 🚣 👍 dd file 🦳 🖻 emove	al			
Details of selected spectrum file				
· · · · · · · · · · · · · · · · · · ·				
	_			
0				
Show Dual Parts: 🔽 First part 🔽 Second part				
Counts Details				
Load files 🔇 Close	.			

Now a standard file selection dialog appears. Select HyperLab sample spectra from folder My Documents \ HyperLab \ HyperLab2005 \ Sample spectra.

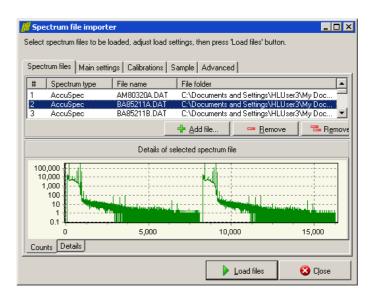
Select AccuSpec file type and all AccuSpec spectrum files where the last letter of the file name is "A", then click *Open*. These measurements were taken with 70-3300 keV energy range.

The selected files appear on the file importer's list.

As you can see, these are Dual LFC spectra with two similar halves. It is essential to correctly set the spectrum data type before loading, as HyperLab splits up dual spectra and stores their parts separately in the database.

Click on tab Main settings.

Open			? ×
Look jn:	C Sample spect	ra 💽 🗢 🛍 📰 -	
My Recent Documents Desktop My Documents My Computer	AM80320A     BA85211A     BA85211B     C001043A     C0001042A     C005185A     C000111A     C000111B     C000111B     C000111B     C000111B     C000111B     EU80297A     EU80297A     EU80297B     MM01041A     RA37076A		
My Network Places	File <u>n</u> ame: Files of <u>t</u> ype:		<u>O</u> pen Cancel



#### Importing spectrum files

🖉 Spectrum file importer	C I TIL
	Set File con
Select spectrum files to be loaded, adjust load settings, then press "Load files" button.	Now the r
Spectrum files Main settings Calibrations Sample Advanced	selected fi
File type	As curren
File content Dual spectrum: LFC-corrected and normal spectrum halves	setups det
	-
Type of 1st half LFC corrected gamma spectrum	the list is
Type of 2nd half Normal HPGe gamma spectrum	measurem
Use file type from spectrum, if detected (e.g. from Ortec SPC files)	on the Net
Measurement	
Meas. method Decay-gamma measurement 🔽 💽	
Meas. setup 🔽 💽 🧎	
Measured by Database administrator	
► Load files S Close	

Set *File content* to Dual LFC. Now the measurement setup should be selected from the list. As currently there are no measurement setups defined yet in the new database, the list is empty. Create a new measurement setup entry by clicking on the *New record* icon:

	🛃 Measurement setup prope	rties	_ 🗆 ×
	Selected measurement setup - pg	More measurement setup entries	
	MEAS. SETUP		
	DETECTOR	D4 🔽 🔽	ð 🐮
	MEASPOSITION	d=25 cm 🔽 🔽	a 😭 🔡
	MEASRANGE	50-3300 keV	) 😭
	NAME	D4 Setup 70keV · 3.3Mev, d=25cm	
	ADC	<b>I</b>	) 🖀 🚫
	STORED BY	Database administrator	1
	STORED AT	2006 Oct 23, 10:31:21	
	COMMENT		
Г		€ Help 💿 OK Sancel 🛛 🖉 A	2pply

The record editor window appears for the measurement setup. As there are no detector, measurement position and measurement range entries in the database yet, these should also be created by clicking on their corresponding *New record* button to the right of the combo boxes.

Create the following entries for the HyperLab 2005 sample spectrum set:

'D4' detector, 'd=25 cm' measurement position, and two measurement energy ranges: '70-3300 keV' as well as '50-2200 keV'. The two measurement setups are differ only in the applied energy range range, thus should be named as 'D4 Setup 70keV - 3.3Mev, d=25cm' and 'D4 Setup 50keV - 2.2Mev, d=25cm'.

After this setting is appropriate, check settings under other tabs as well. If you are ready to load spectrum files, click *Load files*.

🕌 Spectrum file importer 📃 🗖	l×
Please wait until spectrum importing finishes.	
Progress:	
Details	
INFD: Loading Genie2k spectrum file C:\Documents and Settings\HLUser3\My Documents\HyperLab\HyperLab2005\Sample spectra\13_53_31.CNF INFD: Spectrum title: 'Geológiai minták' INFD: Sum count: 24151292, Min count: 0, Max count: 173419 INFD: Sum count: 24151292, Min count: 0, Max count: 173419 INFD: Acquisition start: 2006 May 15, 13:05:00, Truetime: 3600.000 sec, Livetime: 3600.000 sec INFD: Spectrum stored in database (MEASUREMENT_ID=14, SPECTRUM_ID=27-28, ECAL_ID=27-28, FWHMCAL_ID=27-28) INFD: Title: Geológiai minták [13_53_31.CNF] INFD: Energy cal: from spectrum file [E_keV = 0.0263826 + 0.270019 * Ch] INFD: FwHM cal: from spectrum file [Fwhm_ch = SQRT[6.5333 + 0.0085311 * Ch ]] Loading of 14 spectrum files finished at 8/11/2006 6:07:13 AM	
A Back Close	

The spectrum importer now loads all available information from the spectrum file, and stores it in the new database. Click *Close* after loading finished.

The spectrum files will be displayed under *Measurements* node in the database tree now.

Do not forget to import also the spectrum files with "B" as the last letter of the file name. These should be assigned to the measurement setup 50-2200 keV energy range.

# 6. Evaluating spectra

In HyperLab system, you have three ways to evaluate your gamma spectra:

- **Spectrum peak evaluator** in Main Module, which has a rich graphical user interface, and provides all tools necessary to modify and fine-tune your fit region by region, if its one-step automatic deconvolution is not perfect. This is the recommended evaluation method if your spectra are even slightly complicated.
- **Database batch evaluator** in Main Module, which is a special peak evaluation component of HyperLab Main Module. It is capable to automatically evaluate several measurement entries stored in the database, each after the other.
- **Standalone spectrum file evaluator** utility, which operates on a batch of spectrum files, and does not require usage of databases. Please note that this file-based tool does not support neither manual fit refinement, nor nonlinear energy calibration, so its use is recommended only if you are facing with large amount of simple spectrum files, where the simple evaluation is of paramount importance. For further details, see *Quick Start Guide for Spectrum file batch evaluator* section.

As a rule of thumb, we suggest you that always check the details of fitted regions graphically, as this can help to eliminate trivial problems with the spectrum fit. This can be done by using Spectrum peak evaluator or by RTF reports which may contain the fitted regions graphically.

### 6.1. HyperLab peak evaluation basics

During the automatic fit, HyperLab first takes the list of suspected peaks, and tries to optimally determine **regions** – range of consecutive channels – around them. These regions contain one or more suspected peaks, which are fitted (deconvoluted) in a nonlinear fitting procedure as a next step.

HyperLab fits several region and peak parameters for each region during the spectrum deconvolution.

#### Parameters fitted for each region:

- 2<sup>nd</sup> order polynomial for background
- background step amplitude
- skewed hill in the background under low-energy side of peaks (tail, disabled by default)
- peak skewness slope and amplitude for low-energy side of peaks (left skew)
- peak skewness slope and amplitude for high-energy side of peaks (right skew)
- common peak width (FWHM).

#### Parameters fitted individually for each peak:

- position of the peak Gaussian
- amplitude of the peak Gaussian.

HyperLab is able to reliably describe the vast majority of gamma spectra with this versatile fitting function set, commonly named as *Common peak width method*.

There is also a *Variable peak width* fitting method, when the peak width are allowed to vary independently of each other – that is, not a common FWHM value used, but it is fitted for each

#### Evaluating spectra

peak. This may lead to unexpected results for complicated multiplets, so use it only when peak widths truly differ within a region. This is the case, for example for the region around the annihilation peak. HyperLab therefore tries to fit the regions around 511 keV with the Variable peak width fitting method.

Moreover, HyperLab tries to eliminate unnecessary fit components after fitting regions, and to automatically remove them. This may lead to 'disappearing' of various fitted parameters. This parameter elimination step is performed in order to increase the stability and reduce the chisquared value of the final fit and also to reduce the uncertainties of fitted parameters.

See Reference Guide for further details of the fitting process.

### 7. Using of Spectrum peak evaluator

Spectrum peak evaluator is the recommended tool in Main Module to evaluate your spectra in most cases, as it provides you with advanced tools to fine-tune the deconvolution results.

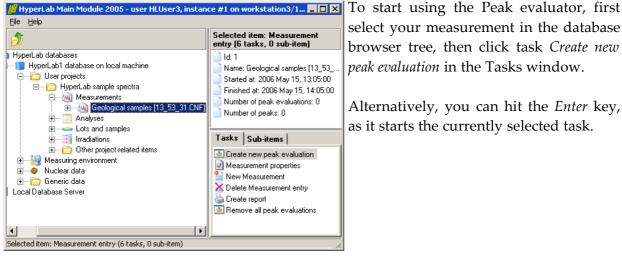
#### 7.1. A bird's eye view of the evaluation process

A routine gamma spectrum deconvolution in Spectrum peak evaluator module consists of several steps:

- Creating a peak evaluation entry in the database for a measurement •
- Starting the evaluator
- Checking measurement's calibrations
- Performing the automatic fit
- Check the resulted regions each after the other, and fine-tuning their fit if necessary
- Saving results into database and report files, as well as exporting data for post-• processing.

The following sections will describe these steps in greater detail.

#### 7.2. Starting the evaluator



select your measurement in the database browser tree, then click task Create new peak evaluation in the Tasks window.

Alternatively, you can hit the *Enter* key, as it starts the currently selected task.

A new peak evaluation creation window appears now. You can leave defaults in most cases, so just click *OK* for now.

7	🚜 Creating new peak evaluation		
l	Please set parameters for the new peak evaluation, then click Ok.		
	NAME Peak eval. of Geological samples [13_53_31.CNF] - 10/23/2006 11:32:		
	PEAK EVAL. METHOD Dual LFC semicond. det. gamma spectrum evaluation		
	PEAK EVAL. SETTINGS Default settings for moderate count rate, regular peaks		
	MEASUREMENT Geological samples [13_53_31.CNF]		
	☑ Start peak evaluation module when I press Ok		
	OK 😮 Cancel		

Main window of spectrum peak evaluator appears now. The center of the window is occupied by the **spectrum window [1]** and the **residual window [2]**. The residual window displays the difference between the measured counts and the fitted peak curves.

A **region list panel [3]** is placed on the right, while a fit **fine tuning toolbar [4]** and a **navigating toolbar [5]** is at the bottom. List of fitted peaks is displayed under the *Peak details* tab.

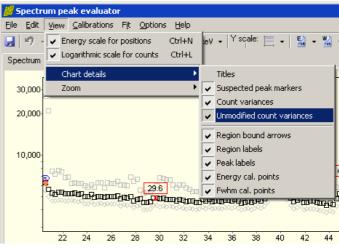
Please note the red triangles in the

<u>File E</u>dit <u>V</u>iew <u>C</u>alibrations Fit <u>O</u>ptions <u>H</u>elp 🛃 🖉 🗸 🍽 🖌 🍭 🥹 🌬 🔍 🌬 🛛 Xunit: keV 🗸 Spectrum Peak details Messages 1 🐴 🍇 **1**\_30,000 20,000 10,000 40 28 30 32 34 42 keV ∍ 20.5

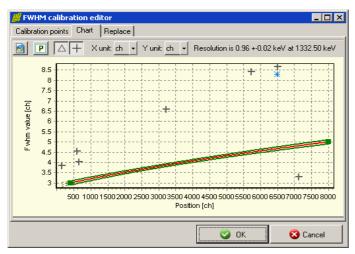
spectrum: these are the **suspected peaks**, whose position is determined by the current FWHM calibration. Deconvolution will use these suspected peaks as an initial estimate.

First you should modify some spectrum display settings. By default, spectrum evaluator displays the counts (black squares) together with the corrected variances (gray squares) and uncorrected variances (gray diamonds). The variance correction is for taking account the distorting effect of high count rates.

For most users it is advisable to switch off the displaying of these variances via the *View / Chart details* menu.



### 7.3. Checking FWHM calibration



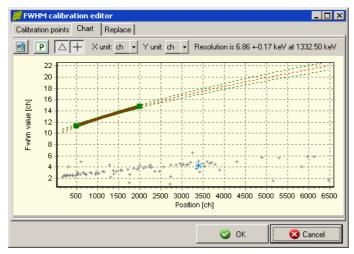
HyperLab's nonlinear spectrum deconvolution algorithm requires only a rough peak width (FWHM) calibration to start working. For exact peak positions, a valid energy calibration is also required.

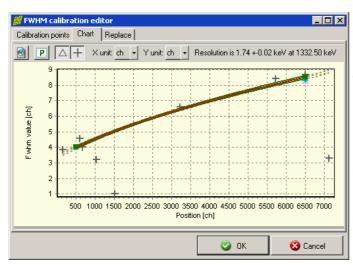
Therefore it is advisable to check first the validity of the FWHM calibration.

To display current FWHM calibration, select *Calibration / FWHM* calibration menu item. Now the FWHM calibration editor window appears.

For a quick calibration check, click *Chart* tab at the top. Currently used FWHM

calibration curve displayed here together with filled green squares as FWHM calibration points. HyperLab also estimates the width of the suspected peaks, and displays these values as gray crosses. The figure shows the case when the FWHM calibration serves too low values.





If large deviation found between the current calibration line (red line), and the suspected peaks' FWHM, then a miscalibrated FWHM may be suspected.

In this case, the FWHM and/or the position values of the FWHM calibration points should be modified on the *Calibration points* page.

The figure shows the case when the FWHM calibration serves higher values than expected.

In case of proper FWHM calibration majority of the suspected peaks' estimated FWHM value is in the neighborhood of the calibration curve.

Please note that large deviations may occur even for valid calibration, as peaks' FWHM values are just rough estimations and not fitted values at this time.

Much better agreement is expected after a successful fit, when peaks' FWHM values are fitted and displayed on this chart as gray triangles.

For further details about FWHM calibration editor window, see *Reference Guide*.

### 7.4. Checking Energy calibration

Exact energy calibration is important for sophisticated tasks, like isotope identification. However, when only a quick peak list is required for well-known isotopes, a rough energy calibration is enough before fit.

The rough energy calibration is only used during spectrum deconvolution for determining the vicinity of the 511 keV annihilation peak, because HyperLab allows to vary the width of peaks independently of each other.

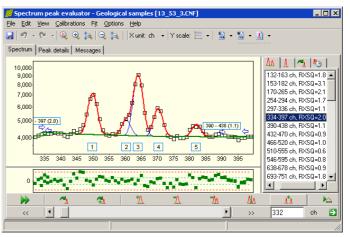
Your energy calibration is proper for fitting if the annihilation peak is in the 509 – 513 keV range. Otherwise select *Calibration / Energy calibration* menu item, and edit the calibration points' position or energy values in order to correct them.

#### 7.5. Performing automatic fit

Click the Autofit button or select Fit / Start automatic fitting menu item to initiate a fit for the whole spectrum. A progress window is displayed during the fit, listing the problematic regions, where the reduced Chi-squared of the fit exceeded 3.

After the automatic fit, the counts of the first fitted spectrum region is displayed, along with the fitted curves of the individual peaks (blue lines), sum curves of all fitted peaks (strong red lines), and sum curves of background components (green lines).

As HyperLab displays all fitted regions which are overlapping over a specific count range, it is common to see several regions, where the background 'wings' of the regions are overlapping. This

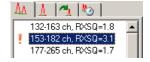


improves the quality of the fits, as more counts may be utilized for background determination, resulting in more stable fits.

End points of the regions are designated by blue arrows, which point towards the center of the region. A region label also displayed at the beginning of the regions, which shows the boundaries of the region and also the chi-squared value of the fitted region.

The region list panel at the right contains several pages, from which the list of regions is displayed. Problematic regions are designated with a small, red exclamation mark.





**Note:** When the fit completes, a finer energy calibration may be constructed, because exact, fitted peak centroid positions are available.

#### 7.6. Navigating fitted regions

Several methods may be used to quickly select a specific region in the Spectrum evaluator. To revise regions one after the other, click double arrow buttons on the Navigation toolbar. To quickly jump to a specific spectrum part, use scrollbar or the Position edit box at the same place.

If you are interested in the problematic regions only, click the region with red exclamation mark on the right.

### 7.7. Refining fitted regions

There are several tools on the Fine tuning toolbar to modify a region's automatic deconvolution.

**Re-fits the clicked region. Rarely used**, only if you suspect that a sub-optimal unstable fit found, which changes when you repeatedly fit the region.

Re-fits the clicked region with automatic peak insertion. Used when a sub-optimal fit found with a missing peak, but the position of the missing peak is uncertain, and you want to delegate the job of peak position determination to the fitting algorithm.

- Insert a peak into the region, at the clicked position. Used when a sub-optimal fit found with a missing peak, and the position of the missing peak is suspected by the user.
- $\mathcal{M}$  Delete a peak from the region, which is located at the clicked position.
- M Delete the clicked region with all of its peaks.
- Splits a region at the clicked position into two half regions.
- Merges two or more regions. To use this tool, click over the first region and drag the mouse cursor to the last region to be merged (do not release the mouse button).

#### 7.8. Saving the results

When you are ready with the fine-tuning of the spectrum evaluation, select *File / Store* menu item to store the fitting details into the database. If required, a Sampo-90 compatible spectrum and peaklist file may also be generated by selecting the *File / Export to Sampo-90 file* menu.

🔏 Creating report 📃 🗆 🗙
Report templates:
[Peak list (PeakEvaluator, PeakList, ListOfPeaks.hrt] Peak evaluation details (PeakEvaluator_PeakList_DetailsWithoutPics.hrt) Peak evaluation details with pictures (PeakEvaluator_PeakList_DetailsWithPics.hrt)
Report styles: Default HyperLab Report Style (1.default.css) Modern Report Style (2.modern.css)
Eile type: Rich Text Format file (*.rtf)

Select *File / Create report* menu item to create detailed fitting reports.

A report creation window appears now, where you can choose between available report templates, report styles and output file formats.

RTF format reports may contain graphical region fits, and can be loading directly into word processors.

For direct printing of reports, you should have Microsoft Word 2000 word

processor installed on your computer.

#### 7.9. Further readings

This Guide mentioned only a few from HyperLab's versatile functions. Please read further details in the *Reference Guide*, which deals with:

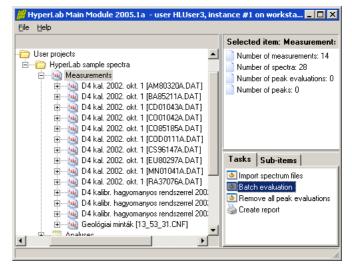
- FWHM and energy calibration,
- Nonlinearity calibration, which serves much more exact peak positions then it is expected from linear energy calibration;
- Efficiency determination, which may be used to generate efficiency-corrected peak lists;
- Database maintenance utilities for keeping your HyperLab databases in best shape,

and much more.

## 8. Using of the Database batch evaluator

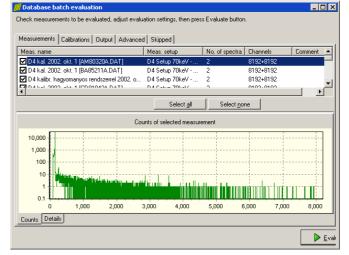
Database batch evaluator is a special peak evaluation component of HyperLab Main Module. It is capable to automatically evaluate several measurement entries stored in the database, each after the other.

To use the Database Batch Evaluator, click on *Measurements* node, then select *Batch evaluation* task.



Now an evaluator window appears, listing all measurements assigned to this project.

Check the list if it is really required to evaluate all spectra. If a measurement to be skipped, un-check it.



Change to Calibrations tab. Set the source of calibrations according to your measurement environment. It is possible to use either the measurement's calibration or an arbitrary one from other measurement.

teasurements [ Calibration	ns Output Advanced Skipped	
Database output		
🔽 Save results into the	gatabase	
Report files		
✓ Save in <u>B</u> TF format	Save in plain <u>I</u> ext format	
Content template:	Peak evaluation details	
Formatting style:	Default HyperLab Report Style	
Post-processing reports		
Save in Sampo-90 F	TF & SPE format	
Dutput file settings		
	C:\Documents and Settings\HLUser3\My Documents\HyperLab\HyperLab2005\Batch	
o alpar <u>i</u> oider. J	c. obcuments and betangs and betangs and betangs any bocuments any percaption approximation	

Specify evaluation output options under Output tab. You can save results into database; generate textual reports or Sampo files for post-processing. Do not forget to set the folder where your report files will be saved.

You may also specify some other settings under Advanced tab.

🚜 7% - D4 kal. 2002. okt. 1 [BA85211A.DAT]	_ 🗆 🗡
Please wait until spectrum evaluation finishes. Progress:	
[INF0: Regions having RXSQ > 3.0: INF0: Regions 48.5 - 6.7 skv(1181-164 ch) RXSQ=41.46 INF0: Maximum region RXSQ = 41.46 ====================================	1
INFD: Evaluation of measurement 'D4 kal. 2002. okt. 1 [BA85211A.DAT]' started at 2006-08-11T06:37:52 INFD: Measurement name: D4 kal. 2002. okt. 1 [BA85211A.DAT] INFD: Short format name: AccuSpec INFD: Comment: INFD: Energy calibration's title: Energy cal. from BA85211A.DAT INFD: Frengy calibration's title: FV+MH cal. from BA85211A.DAT INFD: FV+MH calibration's title: FV+MH cal. from BA85211A.DAT IN	
	-

Click Evaluate button to initiate the batch evaluation.

A new page appears now, displaying the overall progress of the batch as well as detailed messages for the last few measurement evaluation.

When evaluation finishes, press Close button.