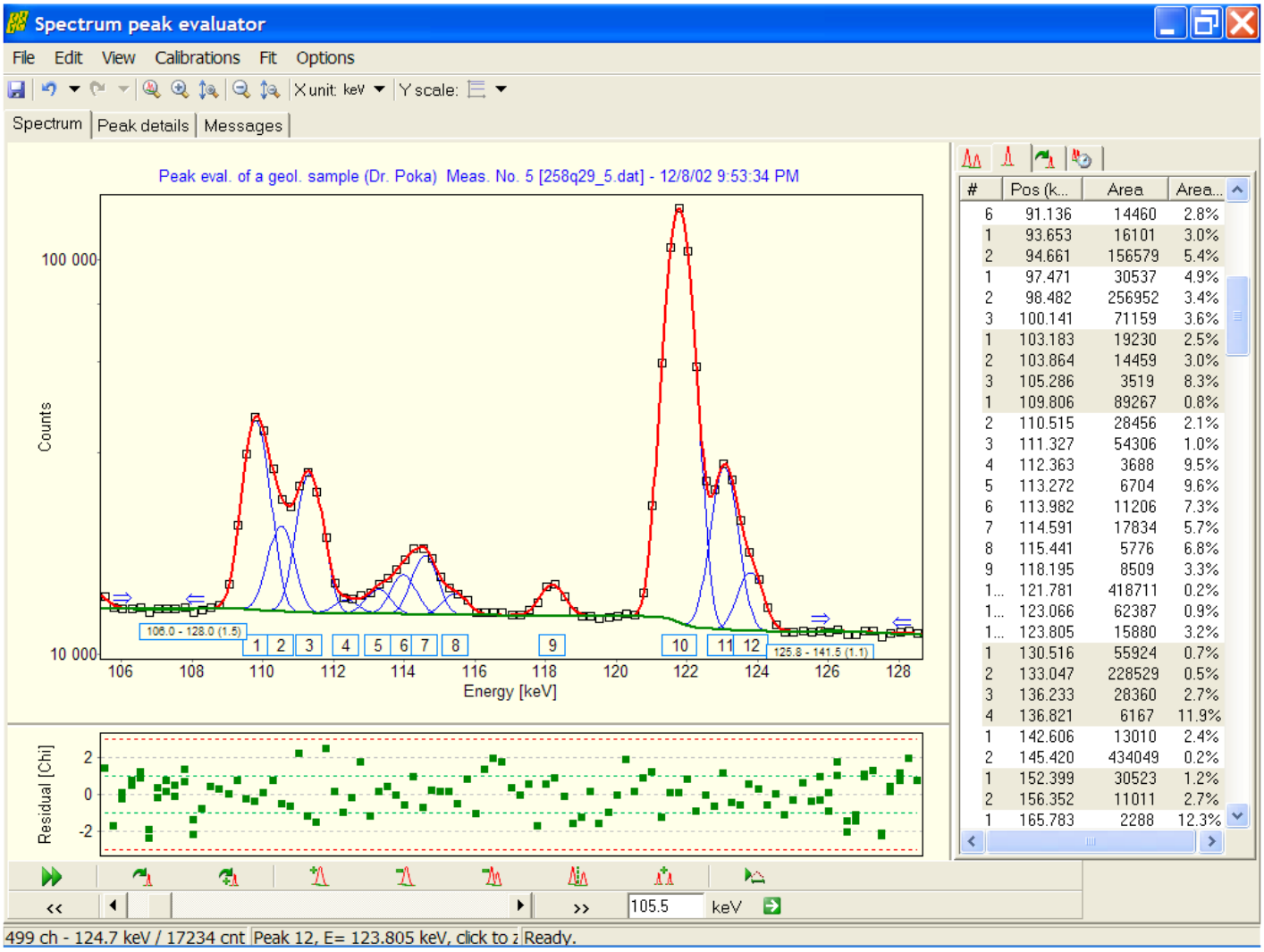
HyperLab Software System

New concepts in gamma spectroscopy

HyperLab is a full-fledged gamma spectroscopy software system, used by many research and industrial laboratories worldwide.



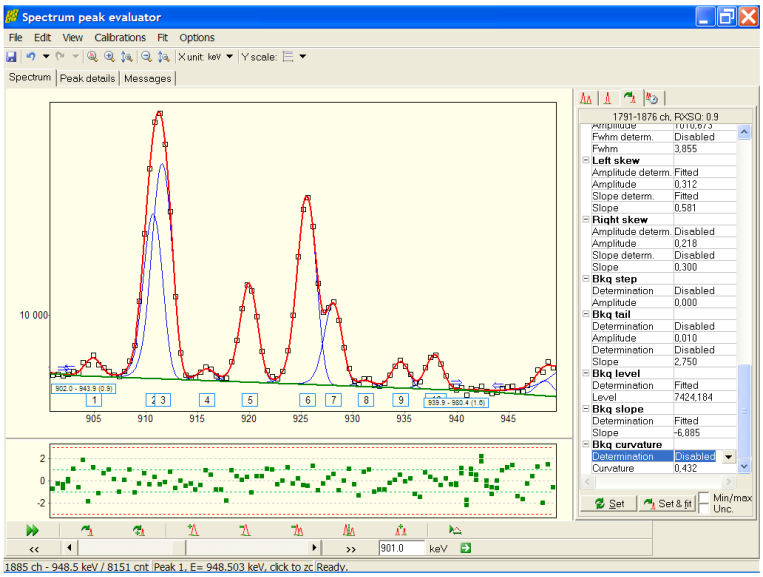
Features

- Superior quality automatic gamma spectrum deconvolution
- Support for Loss-Free Counting and Zero Dead Time techniques: evaluation of Dual LFC and ZDT+Variance spectra
- Visually rich representation of deconvoluted regions, revealing fine details
- Full arsenal of manual deconvolution adjustment tools
- SQL database back-end for spectrum and peak list storage
- Handles most popular spectrum file formats (Canberra's CNF, SPC, MCA, Accuspec etc)
- Detector efficiency and system nonlinearity evaluation ... and much more!

Benefits

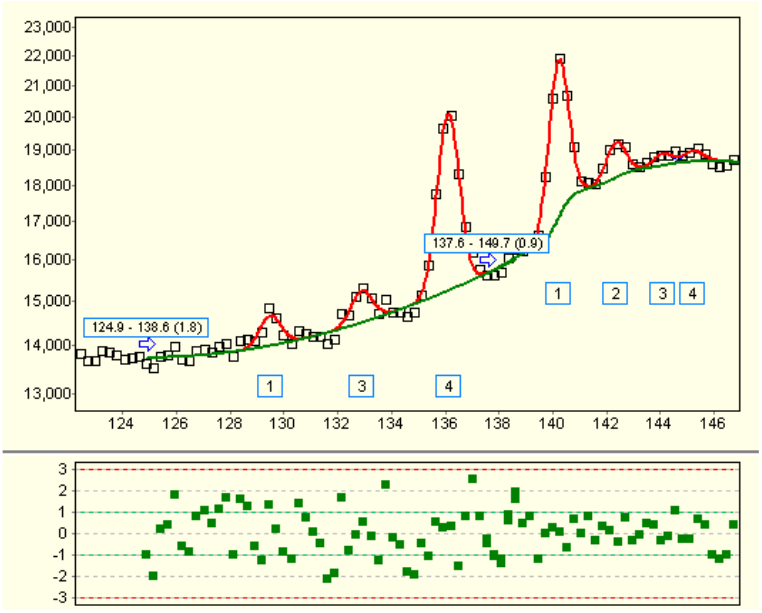
- Much better automatic fit of complicated regions: less manual work.
- Loss-free counting evaluations: changing count rate is no more a problem.
- What you see is what you get: no more blind deconvolutions.
- Full manual control of fits: perfect fits are just a few clicks away.
- SQL database: forget the long inventory of spectrum and evaluation files.
- Nonlinearity and efficiency correction: exact peak locations and corrected peak areas.

Automatic fitting of extremely complex regions



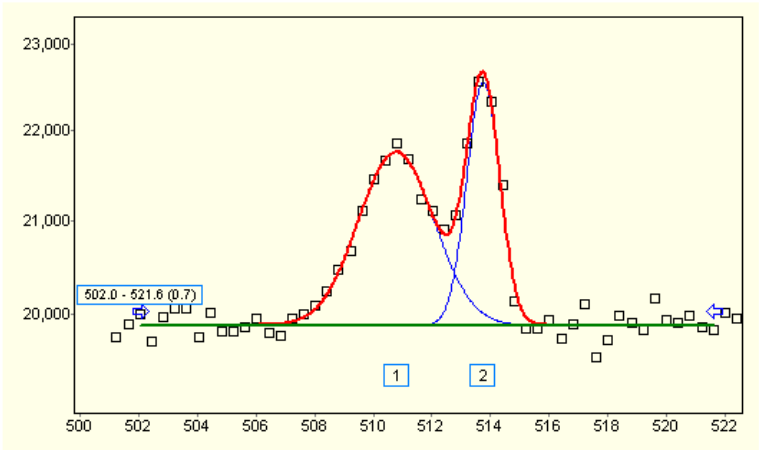
- Automatically locates peaks, requires only a rough FWHM calibration
- Intelligently determines real peak width, location, amplitude, skew, etc.
- Uses semi-empirical peak and background functions
- Background is made of slope, curve, step, skew parts, able to describe all real cases
- Nonlinearity and efficiency correction: exact peak locations and corrected peak areas
- Region backgrounds are overlapping by default, so more stable fits may be achieved

Quick, visual fit refinement



- Region fit manipulation by the mouse over the visual representation of the region fit
- All parameters of the fit may be adjusted by hand, changes are immediately displayed on the fit chart
- Quick peak addition, removal, as well as region split and merge operations by mouse
- Visual FWHM and Energy calibration with quick point addition and removal
- Residual is always visible and helps the manual intervention greatly

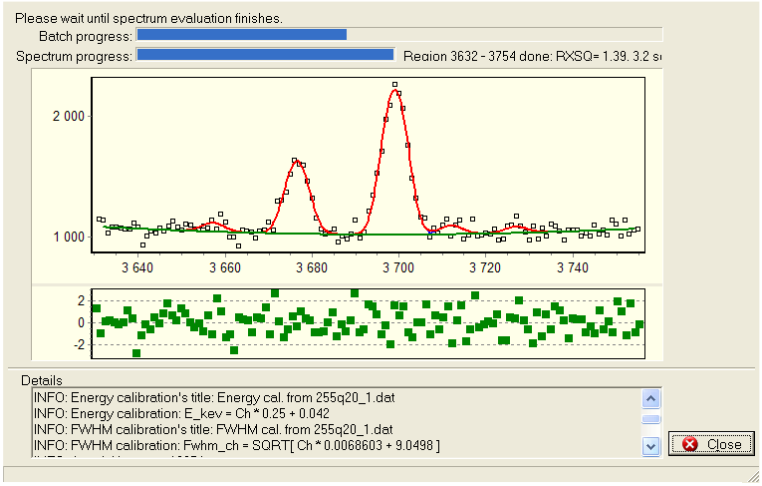
Automatic annihilation peak fit



- HyperLab is able to use a Variable Peak Width method, when all peaks within a region may have significantly different FWHM
- Significant lines may be resolved automatically which are overlapping with the 511keV annihilation peak
- Parameters of the allowed broadening may be adjusted, if necessary

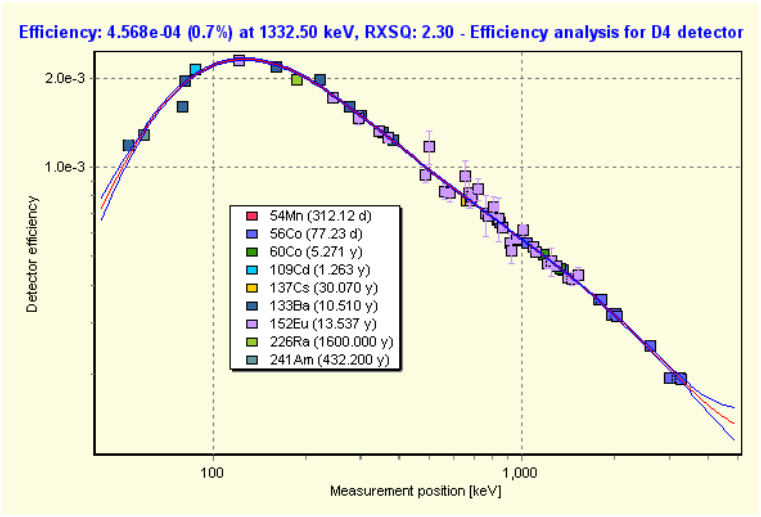
Batch evaluator

- Performs deconvolution of multiple spectra without user intervention
- Stores the deconvolution results into the database, TXT or Sampo-90 files
- Results may be later hand-tuned in the database, with the same visually rich tools as for individual evaluations
- RTF report files optionally with graphical representation of the fits
- Quick results of well-known spectra within minutes



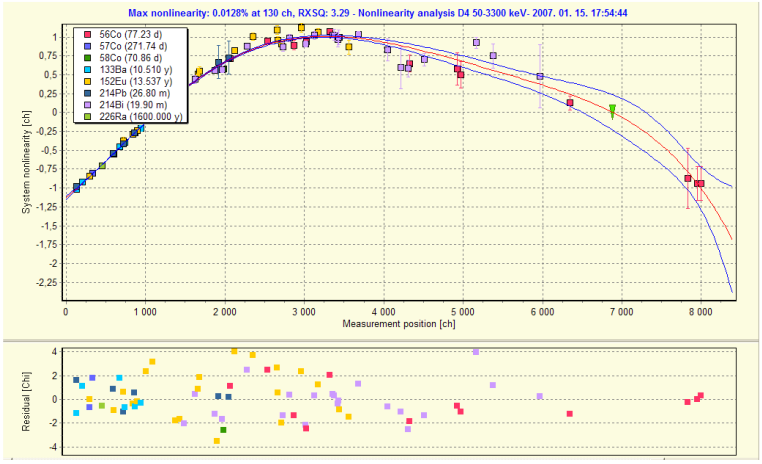
Detector efficiency determination module

- Automatically constructs an absolute or relative full-energy detector efficiency curve
- The curve is fitted with one single orthogonal polynomial, a numerically stable method
- Multiple measurements with multiple isotopes may be used, even with home-made sources
- Achievable precision is around 1% - 0.5% when multiple sources are used, e.g. 133-Ba, 152-Eu, 241-Am, 109-Cd, 57-Co.
- Individual lines may be manually removed if proved to be disturbed
- The efficiency curve may also be used for generating efficiency-corrected peak reports
- Activity of home-made sources may also be calibrated

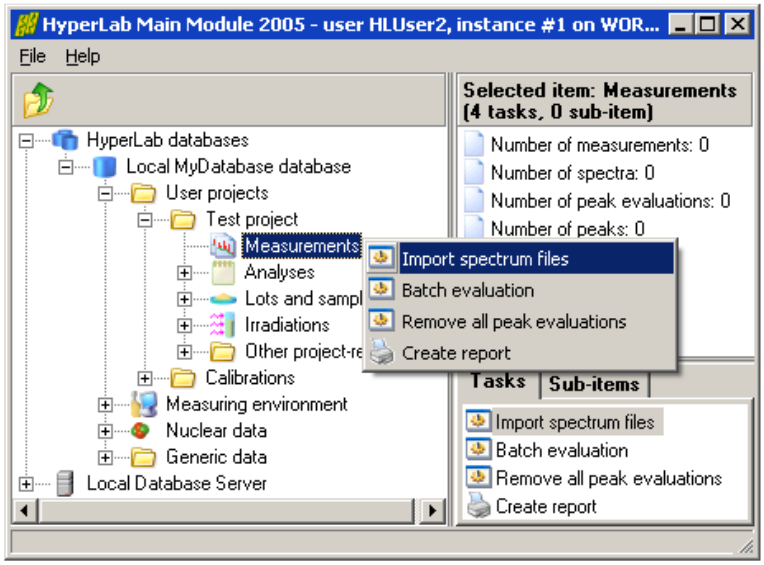


System nonlinearity determination module

- Automatically contructs a nonlinearity curve, which describes the deviation from the ideal channel-energy calibration line
- Multiple measurements may be used, if the identified lines of isotopes are overlapping
- The resulting curve may be used to remove nonlinearity from the energy calibration
- This way the deviation of peak positions from the true value may be reduced to 0.01keV in the whole range

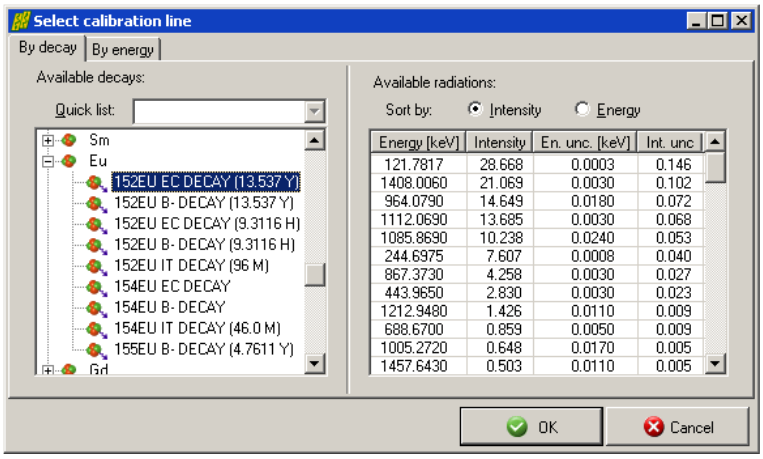


Structured information storage in SQL databases



- Contains specta in compressed form, as well as peaks, nuclear data, and all other information required for routine processing
- Replaces miriads of small spectrum, calibration, DOC etc. files used by conventional systems — a major step towards the paperless bureau
- Provides one independent storage location for all the laboratory's work
- Enforces strict logical relationships, therefore minimizes chance of improper user input
- Helps Quality Assurance
- Excellent for post-processing, e.g. for Excel, utilizing ODBC connections

Integrated nuclear library



- Contains several hundreds nuclides, isomer states and decays
- Assembled from ENSDF data files
- Stored in HyperLab's database, also available to post-processing tools
- Individual radiations may be flagged for usage in energy, FWHM calibration, efficiency evaluation etc.
- All values may be edited, thus enabling correction of problematic data

Customer Service

- Free updates for 1 year after the purchase
- Free customer service for 1 year after the purchase via email
- Smaller software modifications upon user's requests

Developments in progress

- Isotope identification module
- Quantitative analysis module
- Measurement module

System requirements

OS: Windows 2000, XP
CPU minimum: 1GHz PIII
CPU recommended: 2GHz P4
RAM: 256MB
HDD: 200MB

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