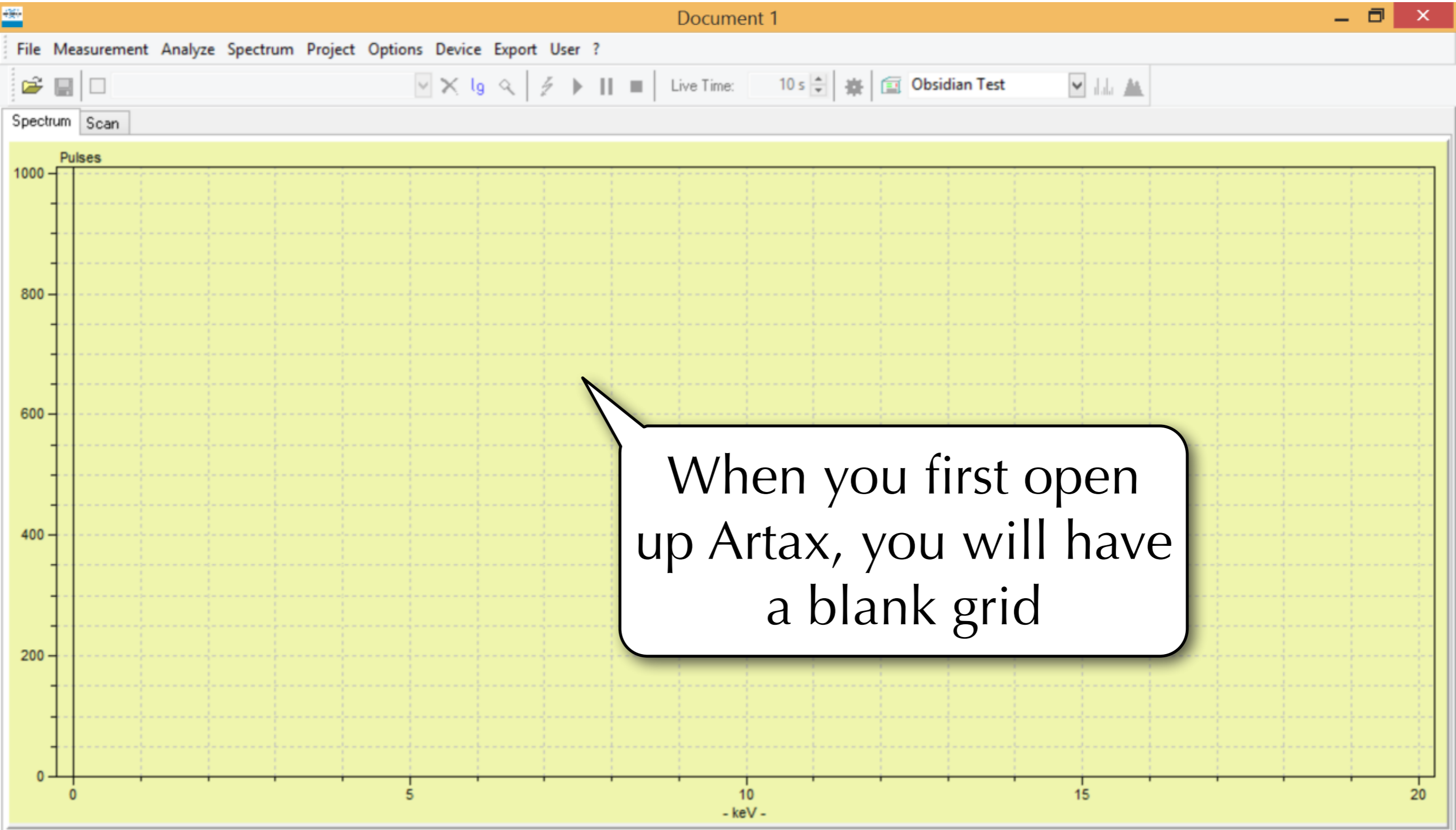


Bayesian Deconvolution

This presentation is designed to provide a step-by-step followthrough. If you have any questions, do not hesitate to contact us.

Bayesian Deconvolution



Bayesian Deconvolution

Document 1

File Measurement Analyze Spectrum **Project** Options Device Export User ?

- New Project
- Close Project
- Display Spectra
- Add Spectra
- Add Picture
- Add Clipboard
- Add Node
- Remove Object

Live Time: 10 s

Obsidian Test

Spectrum Scan

Pulses

1000

800

600

400

200

0

0 5 10 15 20

- keV -

To begin, go to 'Project' and then 'New Project'

E: Cnts: User: Administrator OFFLINE

2:11 PM 1/10/2014

Bayesian Deconvolution

The screenshot shows a software window titled "Document 9" with a menu bar (File, Measurement, Analyze, Spectrum, Project, Options, Device, Export, User ?) and a toolbar. A "New project" dialog is open, showing a File Explorer pane on the left with "Project" and "Objects" folders. The dialog has three tabs: "Spectrum", "Project", and "Scan". The "Project" tab is active, showing "Project Information" with fields for "User: Administrator" and "Comment:". A status bar at the bottom displays "E: 10.82 keV", "Cnts: 171", "User: Administrator", and "OFFLINE". The Windows taskbar at the bottom shows the Start button, Internet Explorer, File Explorer, Chrome, Firefox, and several instances of the software. The system tray shows the date and time as "9:23 AM 1/10/2014".

Document 9

File Measurement Analyze Spectrum Project Options Device Export User ?

Live Time: 10 s Obsidian Test

New project

Project Objects

Spectrum Project Scan

Project Information

User: Administrator

Comment:

You will see three tabs, Spectrum, Project, and Scan

A File Explorer pane will open to the left

E: 10.82 keV Cnts: 171 User: Administrator OFFLINE

9:23 AM 1/10/2014

Bayesian Deconvolution

Document 1

File Measurement Analyze Spectrum Project Options Device Export User ?

Live Time: 10 s Obsidian Test

New project

Project

Objects

- Open Project...
- Save Project As...
- Close Project
- Display Spectra
- Add Spectra
- Add Picture
- Add Clipboard
- Add Node
- Remove Object

Right click on 'Objects'

Select 'Add Node', this will create a sub-folder in the pane

E: Cnts: User: Administrator OFFLINE

2:06 PM 1/10/2014

Bayesian Deconvolution

The image shows a screenshot of a software application window titled "Document 9". The application has a menu bar with "File", "Measurement", "Analyze", "Spectrum", "Project", "Options", "Device", "Export", and "User ?". Below the menu bar is a toolbar with various icons. On the left side, there is a "New project" panel with a tree view showing "Project" and "Objects". In the center, there is a "Project Information" panel with fields for "User: Administrator" and "Comment:". A "Node" dialog box is open in the foreground, with the title "Node" and a close button. The dialog box contains the text "Input new node name:" and a text input field with the word "Node" entered. Below the input field are "OK" and "Cancel" buttons. A speech bubble with the text "A pop-up window will prompt you to enter a name" points to the dialog box. At the bottom of the screen, there is a taskbar with several icons, including the Windows logo, Internet Explorer, File Explorer, Google Chrome, Firefox, and several instances of the software application. The system tray shows the time as 9:26 AM on 1/10/2014. The status bar at the bottom of the application window displays "E: 10.82 keV", "Cnts: 171", "User: Administrator", and "OFFLINE".

Document 9

File Measurement Analyze Spectrum Project Options Device Export User ?

New project

Project Information

User: Administrator

Comment:

Node

Input new node name:

Node

OK Cancel

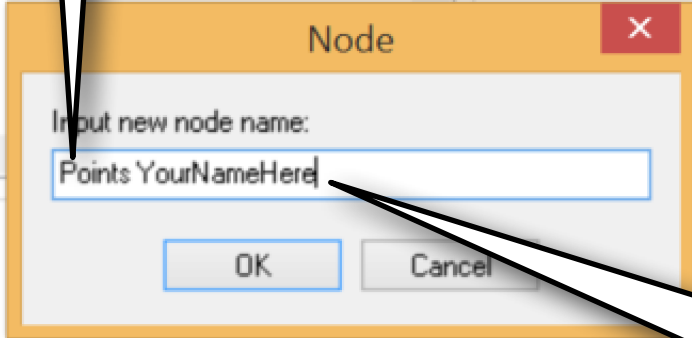
A pop-up window will prompt you to enter a name

E: 10.82 keV Cnts: 171 User: Administrator OFFLINE

9:26 AM 1/10/2014

Bayesian Deconvolution

Always make sure the first word is Points followed by a Space



Node

Input new node name:

Points YourNameHere

OK Cancel

You can add a second name here to identify the data

Bayesian Deconvolution

Document 9

File Measurement Analyze Spectrum Project Options Device Export User ?

Live Time: 10 s

Obsidian Test

New project

Project

Objects

Project Information

User: Administrator

Comment:

Note that there is now a plus sign beside the 'Objects' Folder

E: 10.82 keV Cnts: 171 User: Administrator OFFLINE

9:27 AM 1/10/2014

Bayesian Deconvolution

Document 9

File Measurement Analyze Spectrum Project Options Device Export User ?

Live Time: 10 s

Obsidian Test

New project

Project

Objects

Points YourNameHere

Project Information

User: Administrator

Comment:

Clicking on the plus sign will reveal the sub-folder you created

E: 10.82 keV Cnts: 171 User: Administrator OFFLINE

9:28 AM 1/10/2014

Bayesian Deconvolution

Document 9

File Measurement Analyze Spectrum Project Options Device Export User ?

Live Time: 10 s Obsidian Test

New project

- Project
 - Objects
 - Points YourNameHere

Spectrum Project Scan

53 Pulses

Click on the 'Spectrum' tab to show the grid again

15

10

5

0

2 3 4 5

- keV -

E: 10.82 keV Cnts: 171 User: Administrator OFFLINE

9:29 AM 1/10/2014

Bayesian Deconvolution

Document 9

File Measurement Analyze Spectrum Project Options Device Export User ?

Open Project...
Open Spectrum... Ctrl+O
Open ROI...
Reopen
Save Project As...
Save Spectrum As... Ctrl+S
Save ROI As...
Save Image As...
Exit

Go to 'File' and then 'Open Spectrum'

Spectrum Project Scan

x 1E3 Pulses

10
5
0

2 3 4 5

- keV -

E: 10.82 keV Cnts: 171 User: Administrator OFFLINE

9:30 AM 1/10/2014

Bayesian Deconvolution

A File Explorer window will open

Select 'TRACER spectra (".pdz")' to find your data

The image shows a software interface with a menu bar (File, Measurement, Analyze, Spectrum, Project, Options, Device, Export, User ?) and a toolbar. A 'New project' window is open, showing a project tree with 'Objects' and 'Points YourNameHere'. A 'Spectrum' window displays a plot of 'x 1E3 Pulses'. An 'Open Spectra' dialog box is open, showing the 'Look in:' path as 'Obsidian Cal Data'. The dialog box contains a table with columns 'Name', 'Date modified', 'Type', and 'Size', and a message 'No items match your search.'. Below the table, the 'Files of type:' dropdown menu is open, showing a list of file types: 'Spectra (*.spx)', 'ANSI file (*.txt)', 'EMSA spectra (*.ems)', 'TRACER spectra (*.pdz)', 'Old spectra (*.imp)', and 'Any file (*.*)'. The 'TRACER spectra (*.pdz)' option is selected. The 'Open' and 'Cancel' buttons are visible at the bottom right of the dialog box. The Windows taskbar at the bottom shows the system tray with the time '9:33 AM' and date '1/10/2014'.

Name	Date modified	Type	Size
No items match your search.			

File name:

Files of type:

- Spectra (*.spx)
- Spectra (*.spx)
- ANSI file (*.txt)
- EMSA spectra (*.ems)
- TRACER spectra (*.pdz)
- Old spectra (*.imp)
- Any file (*.*)

Open Cancel

E: 10.82 keV Cnts: 171 User: [username]

9:33 AM 1/10/2014

Bayesian Deconvolution

You can now see all the spectra within the directory you selected

Look in: Obsidian Cal Data

Name	Date modified	Type	Size
OB40Archibarca35.pdz	7/19/2012 10:17 PM	PDZ File	9 KB
OB40Basaltic_Plateau20.pdz	7/19/2012 7:54 PM	PDZ File	9 KB
OB40Big_Southern_Butte06.pdz	7/19/2012 6:24 PM	PDZ File	9 KB
OB40Blue_Mountain04.pdz	7/19/2012 6:13 PM	PDZ File	9 KB
OB40Burns_Green15.pdz	7/19/2012 7:14 PM	PDZ File	9 KB
OB40Cannonball1_22.pdz	7/19/2012 8:37 PM	PDZ File	9 KB
OB40Casa_Diablo10.pdz	7/19/2012 6:48 PM	PDZ File	9 KB
OB40Cerro_del_Medio28.pdz	7/19/2012 9:13 PM	PDZ File	9 KB
OB40Chickahominy26.pdz	7/19/2012 9:02 PM	PDZ File	9 KB
OB40Cougar_Mountain29.pdz	7/19/2012 9:19 PM	PDZ File	9 KB
OB40Davis_Creek27.pdz	7/19/2012 9:08 PM	PDZ File	9 KB
OB40East_Medicine_lake12.pdz	7/19/2012 6:58 PM	PDZ File	9 KB
OB40El_Paraiso24.pdz	7/19/2012 8:51 PM	PDZ File	9 KB
OB40El_Peceno40.pdz	7/19/2012 10:47 PM	PDZ File	9 KB
OB40Glass_Butter03.pdz	7/10/2012 6:00 PM	DD7 File	0 KB

File name:

Files of type: TRACER spectra (*.pdz)

Open Cancel

- keV -

E: 10.82 keV Cnts: 171 User: Administrator OFFLINE

9:32 AM 1/10/2014

Bayesian Deconvolution

Hold down the 'Shift' key on the keyboard to start selecting multiple spectra to analyze with Artax

The screenshot shows the Artax software interface. A file selection dialog box is open, displaying a list of files in the 'Obsidian Cal Data' folder. The files are all PDZ files, each 9 KB in size, and are selected. The dialog box has 'File name:' and 'Files of type:' fields, and 'Open' and 'Cancel' buttons. The background shows the Artax main window with a menu bar (File, Measurement, Analyze, Spectrum, Project, Options, Deconvolution) and a project tree on the left. The status bar at the bottom shows 'E: 10.82 keV', 'Cnts: 171', 'User: Administrator', 'OFFLINE', and the system tray with the time '9:34 AM' and date '1/10/2014'.

Name	Date modified	Type	Size
OB40Archibarca35.pdz	7/19/2012 10:17 PM	PDZ File	9 KB
OB40Basaltic_Plateau20.pdz	7/19/2012 7:54 PM	PDZ File	9 KB
OB40Big_Southern_Butte06.pdz	7/19/2012 6:24 PM	PDZ File	9 KB
OB40Blue_Mountain04.pdz	7/19/2012 6:13 PM	PDZ File	9 KB
OB40Burns_Green15.pdz	7/19/2012 7:14 PM	PDZ File	9 KB
OB40Cannonball1_22.pdz	7/19/2012 8:37 PM	PDZ File	9 KB
OB40Casa_Diablo10.pdz	7/19/2012 6:48 PM	PDZ File	9 KB
OB40Cerro_del_Medio28.pdz	7/19/2012 9:13 PM	PDZ File	9 KB
OB40Chickahominy26.pdz	7/19/2012 9:02 PM	PDZ File	9 KB
OB40Cougar_Mountain29.pdz	7/19/2012 9:19 PM	PDZ File	9 KB
OB40Davis_Creek27.pdz	7/19/2012 9:08 PM	PDZ File	9 KB
OB40East_Medicine_lake12.pdz	7/19/2012 6:58 PM	PDZ File	9 KB
OB40El_Paraiso24.pdz	7/19/2012 8:51 PM	PDZ File	9 KB
OB40El_Peceno40.pdz	7/19/2012 10:47 PM	PDZ File	9 KB
OB40Glass_Butter03.pdz	7/10/2012 6:00 PM	PDZ File	9 KB

Bayesian Deconvolution

The screenshot shows a software window titled 'Document 9' with a menu bar (File, Measurement, Analyze, Spectrum, Project, Options, Device, Export, User ?) and a toolbar. A 'New project' dialog is open, showing a tree view with 'Project', 'Objects', and 'Points YourNameHere'. An 'Open Spectra' dialog is also open, displaying a list of files in the 'Obsidian Cal Data' folder. The files are all PDZ files, and the dialog shows the file name and files of type fields.

Name	Date modified	Type	Size
OB40Obsidian_Cliffs39.pdz	7/19/2012 10:39 PM	PDZ File	9 KB
OB40Pachuca30.pdz	7/19/2012 9:25 PM	PDZ File	9 KB
OB40Paredon34.pdz	7/19/2012 10:04 PM	PDZ File	
OB40Polvadera31.pdz	7/19/2012 9:36 PM	PDZ File	
OB40RS_Hill08.pdz	7/19/2012 6:35 PM	PDZ File	
OB40San_Leonel32.pdz	7/19/2012 9:47 PM	PDZ File	
OB40Sarikamis37.pdz	7/19/2012 10:28 PM	PDZ File	
OB40Timber_Butte01.pdz	7/19/2012 5:49 PM	PDZ File	
OB40Tucker_Hill11.pdz	7/19/2012 6:53 PM	PDZ File	
OB40VNN-2_25.pdz	7/19/2012 8:56 PM	PDZ File	
OB40West_New_Britain1_05.pdz	7/19/2012 6:19 PM	PDZ File	
OB40Whitewater_Ridge09.pdz	7/19/2012 6:41 PM	PDZ File	
OB40Witham_Creek23.pdz	7/19/2012 8:43 PM	PDZ File	
OB40Zacualtipan33.pdz	7/19/2012 9:52 PM	PDZ File	

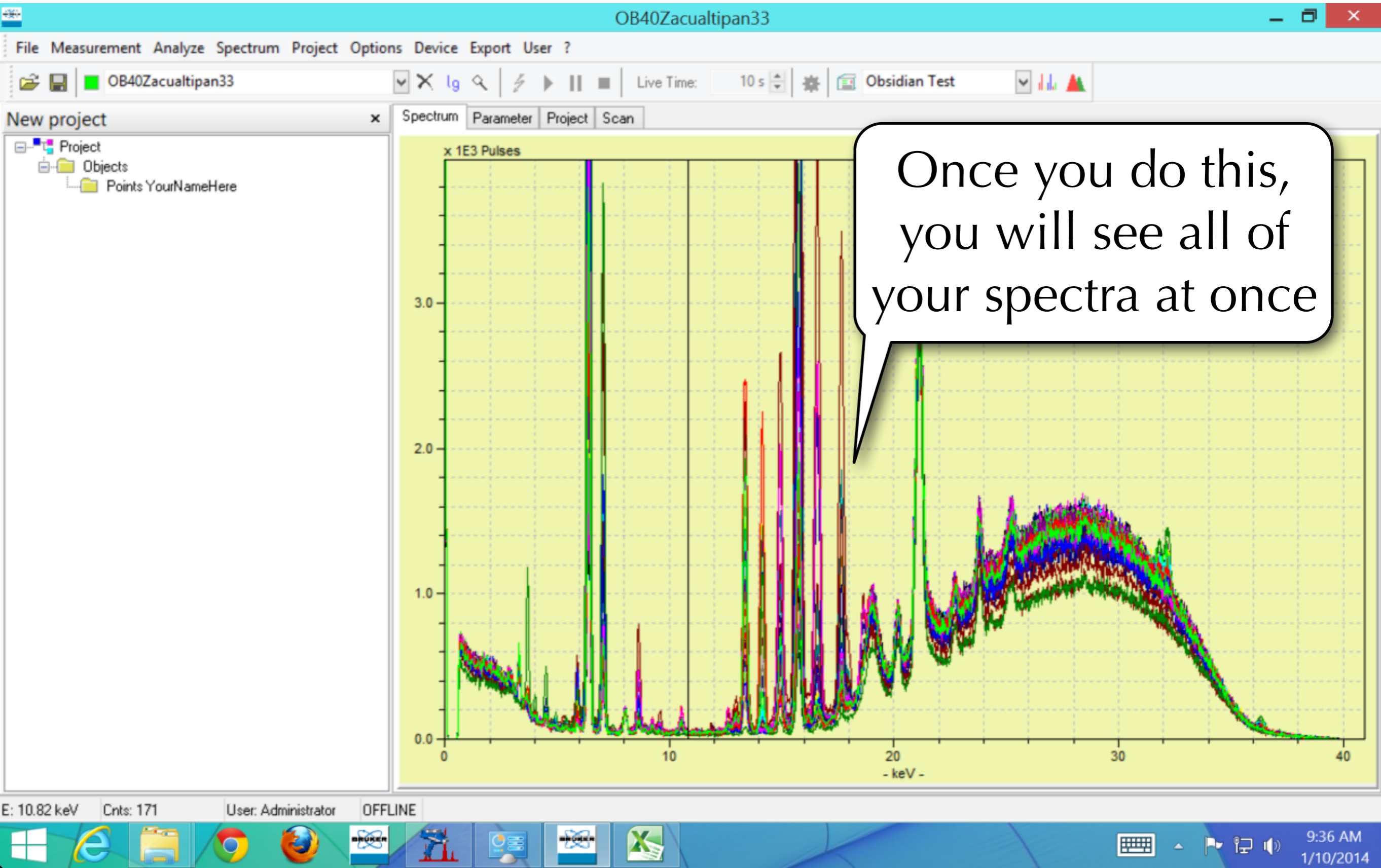
File name: "OB40East_Medicine_lake12.pdz" "OB40El_Paraiso24.pdz" "OB40E_P...

Files of type: TRACER spectra (*.pdz)

Make sure you select all the files you want to analyze

There is a limit - you can only bring in 100 at once. You can store thousands overall, but only by bringing in one hundred at a time

Bayesian Deconvolution



Bayesian Deconvolution

The image shows a software window titled "OB40Zacualtipan33" with a menu bar (File, Measurement, Analyze, Spectrum, Project, Options, Device) and a toolbar. A "New project" sidebar on the left shows a tree view with "Project", "Objects", and "Points YourName". A context menu is open over the "Points YourName" folder, listing options: "Open Project...", "Save Project As...", "Close Project", "Display Spectra", "Add Spectra", "Add Picture", "Add Clipboard", "Add Node", and "Remove Object". The "Add Spectra" option is highlighted. The main window displays a spectrum plot with energy in keV on the x-axis (0 to 40) and intensity on the y-axis (0.0 to 1.0). The plot shows a complex spectrum with many peaks. A status bar at the bottom displays "E: 32.20 keV", "Cnts: 1050", "User: Administrator", and "OFFLINE". The Windows taskbar at the bottom shows the time as 9:37 AM on 1/10/2014.

OB40Zacualtipan33

File Measurement Analyze Spectrum Project Options Device

OB40Zacualtipan33

New project

- Project
- Objects
- Points YourName

- Open Project...
- Save Project As...
- Close Project
- Display Spectra
- Add Spectra**
- Add Picture
- Add Clipboard
- Add Node
- Remove Object

Right click on the data folder you created earlier

Select 'Add Spectra'

1.0

0.0

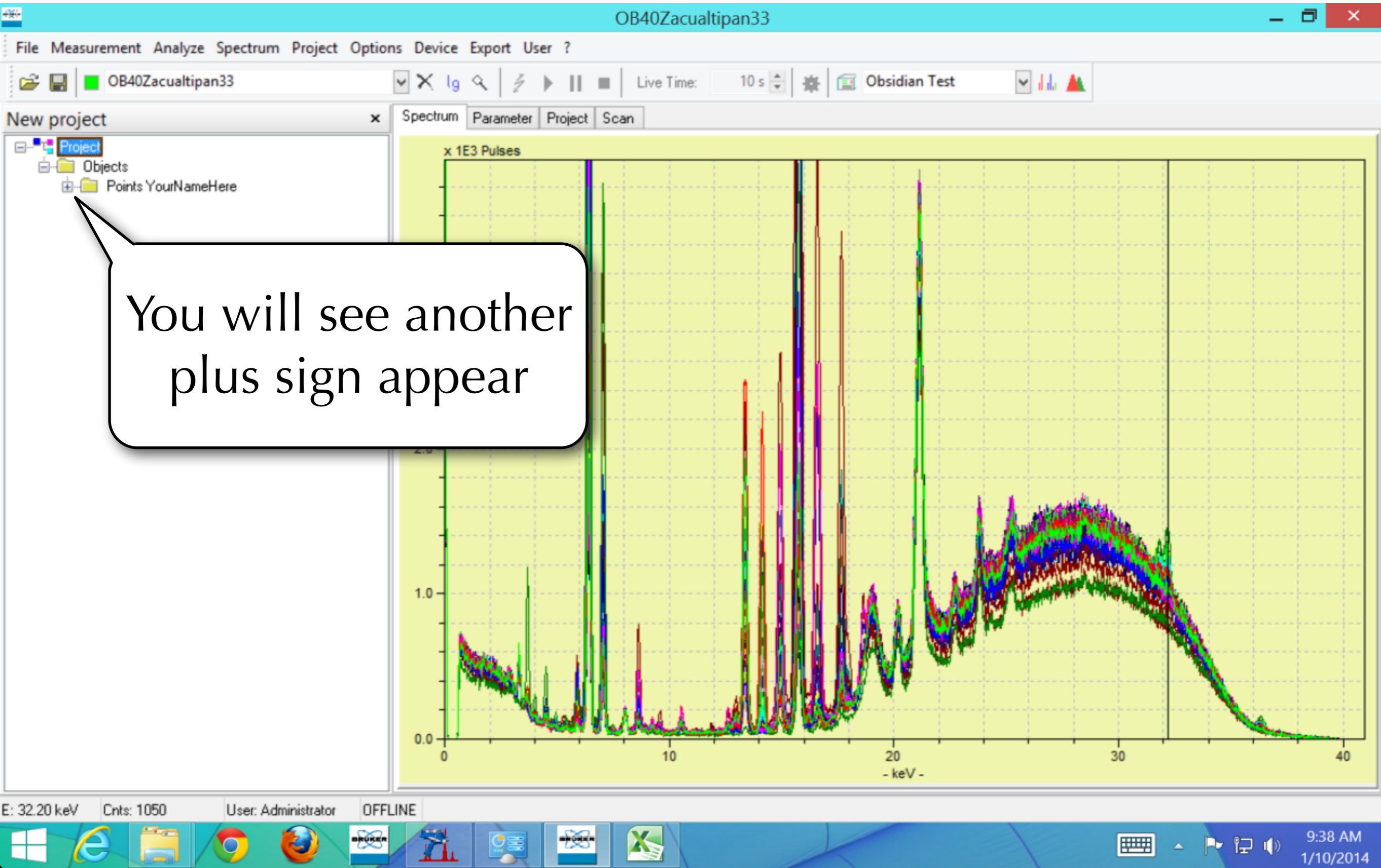
0 10 20 30 40

- keV -

E: 32.20 keV Cnts: 1050 User: Administrator OFFLINE

9:37 AM 1/10/2014

Bayesian Deconvolution



Bayesian Deconvolution

OB40Zacualtipan33

File Measurement Analyze Spectrum Project Options Device Export User ?

OB40Zacualtipan33 Live Time: 10 s Obsidian Test

New project

Points YourNameHere

- OB40Archibarca35@100114_093819
- OB40Basaltic_Plateau20@100114_093819
- OB40Big_Southern_Butte06@100114_093819
- OB40Blue_Mountain04@100114_093819
- OB40Burns_Green15@100114_093819
- OB40Cannonball1_22@100114_093819
- OB40Casa_Diablo10@100114_093819
- OB40Cerro_del_Medio28@100114_093819
- OB40Chickahominy26@100114_093819
- OB40Cougar_Mountain29@100114_093819
- OB40Davis_Creek27@100114_093819
- OB40East_Medicine24@100114_093819
- OB40El_Paraiso24@100114_093819
- OB40El_Peceno40@100114_093819
- OB40Glass_Buttes03@100114_093819
- OB40Grasshopper_Flat13@100114_093819
- OB40Gregory_Creek38@100114_093819
- OB40Guadalupe_Victoria02@100114_093819
- OB40Inman_Creek14@100114_093819
- OB40KES_276_18@100114_093819
- OB40KES_362_17@100114_093819
- OB40La_Joya16@100114_093819
- OB40McDaniel_Tank21@100114_093819
- OB40Meydan_Tepe36@100114_093819
- OB40Mono_Craters07@100114_093819
- OB40Mule_Creek19@100114_093819
- OB40Obsidian_Cliffs39@100114_093819
- OB40Pachuca30@100114_093819
- OB40Paredon34@100114_093819
- OB40Polvadera31@100114_093819
- OB40RS_Hill08@100114_093819

Spectrum Parameter Project Scan

x 1E3 Pulses

3.0

2.0

1.0

0.0

0 10 20 30 40

- keV -

All of your spectra will be imported into the sub folder. While you can see only 100 spectra at a time in the grid, folders in this pane can hold thousands of spectra

E: 32.20 keV Cnts: 1050 User: Administrator OFFLINE

9:39 AM 1/10/2014

Bayesian Deconvolution

The screenshot displays the Artax software interface. The main window shows a spectrum plot with the y-axis labeled "x 1E3 Pulses" and the x-axis labeled "- keV -". The plot shows a complex spectrum with multiple peaks, overlaid with a deconvolution fit consisting of several individual peaks. The interface includes a menu bar with options like "File", "Measurement", "Analyze", "Spectrum", "Project", "Options", "Device", "Export", and "User ?". A "File" menu is open, showing options such as "Open Project...", "Open Spectrum...", "Open ROI...", "Reopen", "Save Project As...", "Save Spectrum As...", "Save ROI As...", "Save Image As...", and "Exit". A file explorer window is also open, showing a list of folders and files, including "OB40Chickahominy26@", "OB40Cougar_Mountain", "OB40Davis_Creek27@", "OB40East_Medicine_la", "OB40El_Paraiso24@10", "OB40El_Peceno40@10", "OB40Glass_Buttas03@10", "OB40Grasshopper_Flat13@100114_093", "OB40Gregory_Creek38@100114_09381", "OB40Guadalupe_Victoria02@100114_0", "OB40Inman_Creek14@100114_093819", "OB40KES_276_18@100114_093819", "OB40KES_362_17@100114_093819", "OB40La_Joya16@100114_093819", "OB40McDaniel_Tank21@100114_0938", "OB40Meydan_Tepe36@100114_09381", "OB40Mono_Craters07@100114_093819", "OB40Mule_Creek19@100114_093819", "OB40Obsidian_Cliffs39@100114_09381", "OB40Pachuca30@100114_093819", "OB40Paredon34@100114_093819", "OB40Polvadera31@100114_093819", and "OB40RS_Hill08@100114_093819". A status bar at the bottom shows "E: 32.20 keV", "Cnts: 1050", "User: Administrator", and "OFFLINE". The Windows taskbar at the bottom shows the time as 9:40 AM on 1/10/2014.

OB40Zacualtipan33

File Measurement Analyze Spectrum Project Options Device Export User ?

Open Project...
Open Spectrum... Ctrl+O
Open ROI...
Reopen
Save Project As...
Save Spectrum As... Ctrl+S
Save ROI As...
Save Image As...
Exit

OB40Chickahominy26@
OB40Cougar_Mountain
OB40Davis_Creek27@
OB40East_Medicine_la
OB40El_Paraiso24@10
OB40El_Peceno40@10
OB40Glass_Buttas03@10
OB40Grasshopper_Flat13@100114_093
OB40Gregory_Creek38@100114_09381
OB40Guadalupe_Victoria02@100114_0
OB40Inman_Creek14@100114_093819
OB40KES_276_18@100114_093819
OB40KES_362_17@100114_093819
OB40La_Joya16@100114_093819
OB40McDaniel_Tank21@100114_0938
OB40Meydan_Tepe36@100114_09381
OB40Mono_Craters07@100114_093819
OB40Mule_Creek19@100114_093819
OB40Obsidian_Cliffs39@100114_09381
OB40Pachuca30@100114_093819
OB40Paredon34@100114_093819
OB40Polvadera31@100114_093819
OB40RS_Hill08@100114_093819

x 1E3 Pulses

Don't forget to save your file, this will also save a copy of all spectra loaded into Artax

0 10 20 30 40
- keV -

E: 32.20 keV Cnts: 1050 User: Administrator OFFLINE

9:40 AM 1/10/2014

Bayesian Deconvolution

The image shows a screenshot of the Artax software interface. The main window displays a spectrum plot with several peaks and a 'Save Project' dialog box is open over it. The dialog box shows the 'Save in' location as 'Desktop' and lists various folders including 'SkyDrive', 'Libraries', '220', 'Baekje', 'Helium Cal', 'Kalamata', 'Helium Cal 2', 'Historic Cu Alloys Reference Set', 'Jade', 'MACC', 'Munich', and 'New folder'. The 'File name' field contains 'GiveltAName' and the 'Save as type' is set to 'Project (*.rbx)'. A speech bubble points to the dialog box with the text: 'A normal file explorer window will open and allow you to save your Artax project in a location of your choice'. The software interface includes a menu bar (File, Measurement, Analyze, Spectrum, Project, Options, Device, Export, User ?), a toolbar with icons for file operations and a 'Live Time' display set to 10 s. The status bar at the bottom shows 'E: 32.20 keV', 'Cnts: 1050', 'User: Administrator', and 'OFFLINE'. The system tray at the bottom right shows the time as 9:41 AM on 1/10/2014.

OB40Zacualtipan33

File Measurement Analyze Spectrum Project Options Device Export User ?

OB40Zacualtipan33

Live Time: 10 s

Obsidian Test

New project

Spectrum Parameter Project Scan

x 1E3 Pulses

Save Project

Save in: Desktop

SkyDrive

Libraries

220

Baekje

Helium Cal

Kalamata

Helium Cal 2

Historic Cu Alloys Reference Set

Jade

MACC

Munich

New folder

File name: GiveltAName

Save as type: Project (*.rbx)

Save

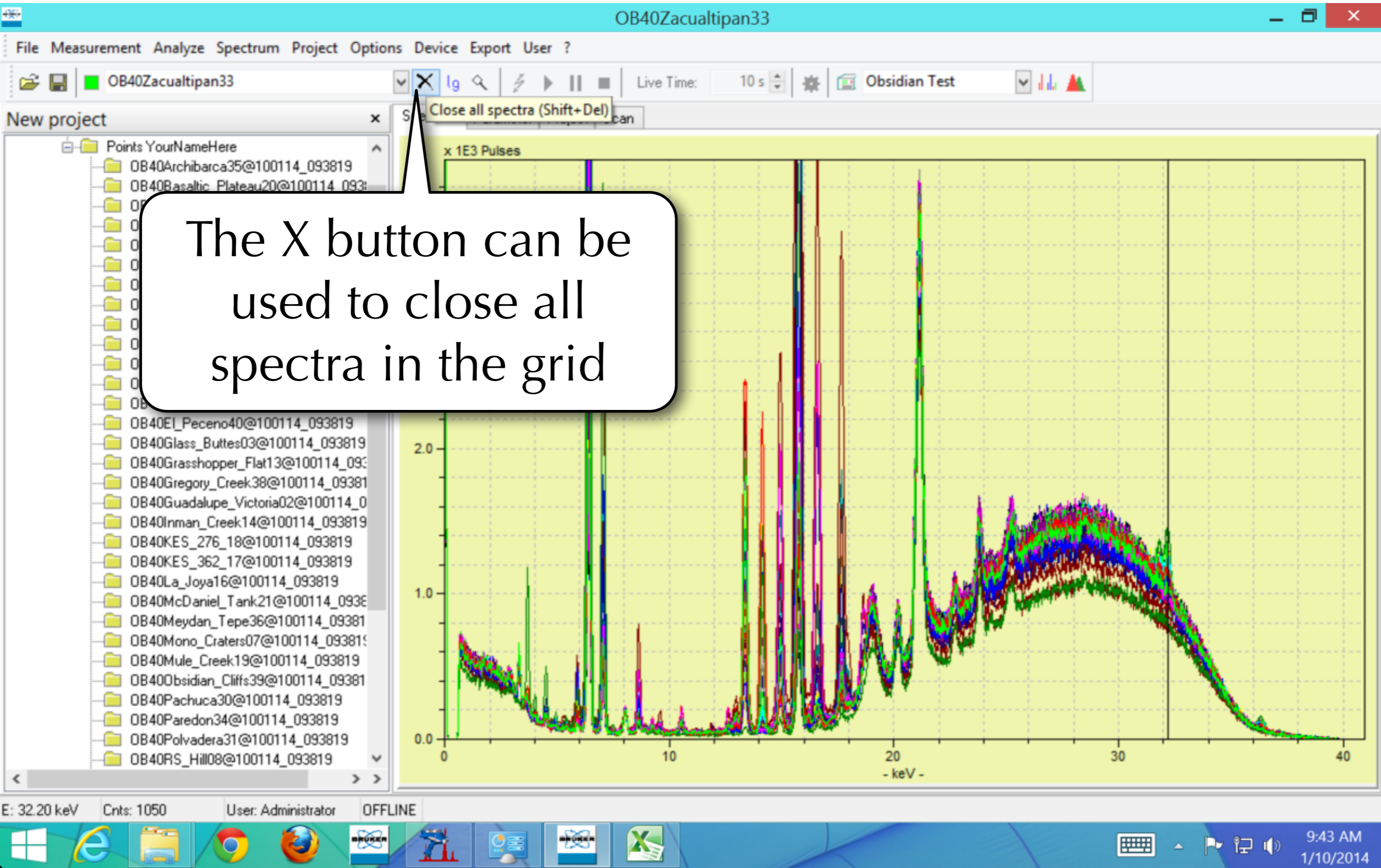
Cancel

E: 32.20 keV Cnts: 1050 User: Administrator OFFLINE

9:41 AM 1/10/2014

A normal file explorer window will open and allow you to save your Artax project in a location of your choice

Bayesian Deconvolution



Bayesian Deconvolution

Document 10

File Measurement Analyze Spectrum Project Options Device Export User ?

Live Time: 10 s Obsidian Test

New project

- Points YourNameHere
 - OB40Archibarca35@100114_093819
 - OB40Basaltic_Plateau20@100114_093819
 - OB40Big_Southern_Butte06@100114_093819
 - OB40Blue_Mountain04@100114_093819
 - OB40Burns_Green15@100114_093819
 - OB40Cannonball1_22@100114_093819
 - OB40Casa_Diablo10@100114_093819
 - OB40Cerro_del_Medio28@100114_093819
 - OB40Chickahominy26@100114_093819
 - OB40Cougar_Mountain29@100114_093819
 - OB40Davis_Creek27@100114_093819
 - OB40East_Medicine_lake12@100114_093819
 - OB40El_Paraiso24@100114_093819
 - OB40El_Peceno40@100114_093819
 - OB40Glass_Buttes03@100114_093819
 - OB40Grasshopper_Flat13@100114_093819
 - OB40Gregory_Creek38@100114_093819
 - OB40Guadalupe_Victoria02@100114_093819
 - OB40Inman_Creek14@100114_093819
 - OB40KES_276_18@100114_093819
 - OB40KES_362_17@100114_093819
 - OB40La_Joya16@100114_093819
 - OB40McDaniel_Tank21@100114_093819
 - OB40Meydan_Tepe36@100114_093819
 - OB40Mono_Craters07@100114_093819
 - OB40Mule_Creek19@100114_093819
 - OB40Obsidian_Cliffs39@100114_093819
 - OB40Pachuca30@100114_093819
 - OB40Paredon34@100114_093819
 - OB40Polvadera31@100114_093819
 - OB40RS_Hill08@100114_093819

Spectrum Project Scan

x 1E3 Pulses

1.0

0.0

0 2 4 6 8

- keV -

The grid is now empty of all spectra, but you can add new spectra from the pane to the side at any time

E: 32.20 keV Cnts: 1050 User: Administrator OFFLINE

9:44 AM 1/10/2014

Bayesian Deconvolution

OB40Archibarca35@100114_093819

File Measurement Analyze Spectrum Project Options Device Export User ?

OB40Archibarca35@100114_093819 Live Time: 10 s Obsidian Test

New project

Points YourNameHere

- OB40Archibarca35@100114_093819
- OB40Basaltic_Plateau20@100114_093819
- OB40Big_Southern_Butte06@100114_093819
- OB40Blue_Mountain04@100114_093819
- OB40Burns_Green15@100114_093819
- OB40Cannonball1_22@100114_093819
- OB40Casa_Diablo10@100114_093819
- OB40Cerro_del_Medio28@100114_093819
- OB40Chickahominy26@100114_093819
- OB40Cougar_Mountain29@100114_093819
- OB40Davis_Creek27@100114_093819
- OB40East_Medicine_lake12@100114_093819
- OB40El_Paraiso24@100114_093819
- OB40El_Peceno40@100114_093819
- OB40Glass_Butttes03@100114_093819
- OB40Grasshopper_Flat13@100114_093819
- OB40Gregory_Creek38@100114_093819
- OB40Guadalupe_Victoria02@100114_093819
- OB40Inman_Creek14@100114_093819
- OB40KES_276_18@100114_093819
- OB40KES_362_17@100114_093819
- OB40La_Joya16@100114_093819
- OB40McDaniel_Tank21@100114_093819
- OB40Meydan_Tepe36@100114_093819
- OB40Mono_Craters07@100114_093819
- OB40Mule_Creek19@100114_093819
- OB40Obsidian_Cliffs39@100114_093819
- OB40Pachuca30@100114_093819
- OB40Paredon34@100114_093819
- OB40Polvadera31@100114_093819
- OB40RS_Hill08@100114_093819

Spectrum Parameter Project Scan

x 1E3 Pulses

2.0

1.0

0.0

0 10 20 30 40

- keV -

Select the first spectra

You will see that spectra appear in the grid

E: 32.20 keV Cnts: 1050 User: Administrator OFFLINE

9:45 AM 1/10/2014

Bayesian Deconvolution

The screenshot displays a software window titled "OB40Archibarca35@100114_093819". The interface includes a menu bar with options like "File", "Measurement", "Analyze", "Spectrum", "Project", "Options", "Device", "Export", and "User?". Below the menu is a toolbar with icons for file operations and a "Live Time" indicator set to "10 s". A "New project" panel on the left lists various project folders, with "OB40Archibarca35@100114_093819" selected. The main area shows a spectrum plot with a red line representing the data. The y-axis is labeled "x 1E3 Pulses" and ranges from 0.0 to 2.0. The x-axis is labeled "- keV -" and ranges from 0 to 40. A callout box points to an "Edit methods (Ctrl+E)" button in the upper right corner of the plot area. The status bar at the bottom shows "E: 32.20 keV", "Cnts: 1050", "User: Administrator", and "OFFLINE". The Windows taskbar at the very bottom shows the time as 9:46 AM on 1/10/2014.

OB40Archibarca35@100114_093819

File Measurement Analyze Spectrum Project Options Device Export User ?

OB40Archibarca35@100114_093819 Live Time: 10 s Obsidian Test

New project

Points YourNameHere

- OB40Archibarca35@100114_093819
- OB40Basaltic_Plateau20@100114_093819
- OB40Big_Southern_Butte06@100114_093819
- OB40Blue_Mountain04@100114_093819
- OB40Burns_Green15@100114_093819
- OB40Cannonball1_22@100114_093819
- OB40Casa_Diablo10@100114_093819
- OB40Cerro_del_Medio28@100114_093819
- OB40Chickahominy26@100114_093819
- OB40Cougar_Mountain29@100114_093819
- OB40Davis_Creek27@100114_093819
- OB40East_Medicine_lake12@100114_093819
- OB40El_Paraiso24@100114_093819
- OB40El_Peceno40@100114_093819
- OB40Glass_Buttess03@100114_093819
- OB40Grasshopper_Flat13@100114_093819
- OB40Gregory_Creek38@100114_093819
- OB40Guadalupe_Victoria02@100114_093819
- OB40Inman_Creek14@100114_093819
- OB40KES_276_18@100114_093819
- OB40KES_362_17@100114_093819
- OB40La_Joya16@100114_093819
- OB40McDaniel_Tank21@100114_093819
- OB40Meydan_Tepe36@100114_093819
- OB40Mono_Craters07@100114_093819
- OB40Mule_Creek19@100114_093819
- OB40Obsidian_Cliffs39@100114_093819
- OB40Pachuca30@100114_093819
- OB40Paredon34@100114_093819
- OB40Polvadera31@100114_093819
- OB40RS_Hill08@100114_093819

Spectrum Parameter Project Scan

x 1E3 Pulses

Edit methods (Ctrl+E)

Next, click on the 'Edit Methods' button to the upper right

2.0
1.0
0.0

0 10 20 30 40

- keV -

E: 32.20 keV Cnts: 1050 User: Administrator OFFLINE

9:46 AM 1/10/2014

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Method Editor

Comment: Name: Obsidian Test

- NIST 610 15 keV
- NIST 610 40 keV
- NIST 610 keV
- Obsidian Gracey Test
- obsidian analysis
- Obsidian SI
- Obsidian Test

Automatic evaluation 1/23/2013 10:54:28 AM

Measurement Corrections Identification Quantification

Generator: _____

Voltage: _____ kV

Current: _____

Stop condition

Time: 10

Left: _____

Right: 0

Counts: _____

Excitation

Anode: _____

Filter: _____

Optic: Collimat

Atmosphere: _____

Energy range: _____

Ok Cancel Help

E: 30.77 keV Cnts: 1321 User: Administrator OFFLINE

10:27 AM 1/10/2014

Bayesian Deconvolution

The Corrections Tab will need some editing based on your spectra

The screenshot displays a software interface for spectral analysis. On the left, a file explorer shows a list of folders with names like 'OB40Burns_Green15@100114_09'. In the center, a 'Method Editor' dialog box is open, showing a list of methods including 'Obsidian Test'. The 'Corrections' tab is selected, with options for 'Escape', 'Shelf', and 'Background' (checked). The 'Background' section is configured with 'Cycles: 40', 'Start: 0.0 keV', and 'End: 0.0 keV'. On the right, a spectral plot shows a red line representing the spectrum on a yellow grid. The x-axis is labeled with values 30 and 40. At the bottom, a status bar shows 'E: 30.77 keV', 'Cnts: 1321', 'User: Administrator', and 'OFFLINE'. The Windows taskbar at the very bottom shows the time as 10:33 AM on 1/10/2014.

Bayesian Deconvolution

Make sure 'Escape' and 'Background' corrections are checked. Shelf corrections don't apply to the Tracer

Change Cycles to 9 to reduce processing time

The screenshot displays a software interface for Bayesian Deconvolution. On the left, a file explorer shows a list of folders with names like 'OB40Burns_Green15@100114_09'. The central dialog box has tabs for 'Measurement', 'Corrections', 'Identification', and 'Quantification'. Under the 'Corrections' tab, the 'Escape' and 'Background' checkboxes are checked, while 'Shelf' is unchecked. The 'Cycles' field is set to 9, with 'Start' and 'End' fields both set to 0.0 keV. A callout bubble points to the 'Cycles' field with the text 'Change Cycles to 9 to reduce processing time'. Another callout bubble points to the 'Escape' and 'Background' checkboxes with the text 'Make sure 'Escape' and 'Background' corrections are checked. Shelf corrections don't apply to the Tracer'. On the right, a graph shows a red curve on a yellow grid, with a vertical line at 30 keV. The status bar at the bottom shows 'E: 30.77 keV', 'Cnts: 1321', 'User: Administrator', and 'OFFLINE'. The taskbar at the bottom includes icons for Windows, Internet Explorer, File Explorer, Chrome, Firefox, and several instances of the Bruker software.

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Method Editor

Comment: Name: Obsidian Test

- NIST 610 15 keV
- NIST 610 40 keV
- NIST 610 keV
- Obsidian Gracey Test
- obsidian analysis
- Obsidian SI
- Obsidian Test

Automatic evaluation 1/23/2013 10:54:28 AM

Measurement Corrections Identification Quantification

Escape
 Shelf
 Background Cycles: 9 Start: 1.0 keV End: 40 keV

Change Start and End to cover the range of data you are analyzing. in this case, it is 1 to 40 keV

Ok Cancel Help

E: 30.77 keV Cnts: 1321 User: Administrator OFFLINE 10:38 AM 1/10/2014

Bayesian Deconvolution

The image shows a screenshot of a software application window titled "New project" with a file explorer on the left and a central control panel. A callout box points to the "Identification" tab in the control panel. The control panel includes a "Comment" field, a "Name" field, a checked "Automatic evaluation" checkbox, a date and time stamp "1/23/2013 10:54:28 AM", and four tabs: "Measurement", "Corrections", "Identification", and "Quantification". Under the "Identification" tab, there are three radio button options: "Line markers" (selected), "Preset list", and "Automatic". At the bottom of the control panel are "Ok", "Cancel", and "Help" buttons. To the right, a portion of a graph is visible, showing a red line on a yellow grid with a vertical line at approximately x=32. The x-axis is labeled with "30" and "40".

Next go to the Identification tab

File Measurement Analyze Spectrum Project
OB40Archibarca35@100114_093819

New project

Points YourNameHere

- OB40Archibarca35@100114_093819
- OB40Basaltic_Plateau20@100114_093819
- OB40Big_Southern_Butte06@100114_093819
- OB40Blue_Mountain04@100114_093819
- OB40Burns_Green15@100114_093819
- OB40Cannonball1_22@100114_093819
- OB40Casa_Diablo10@100114_093819
- OB40Cerro_del_Medio28@100114_093819
- OB40Chickahominy26@100114_093819
- OB40Cougar_Mountain29@100114_093819
- OB40Davis_Creek27@100114_093819
- OB40East_Medicine_lake12@100114_093819
- OB40El_Paraiso24@100114_093819
- OB40El_Peceno40@100114_093819
- OB40Glass_Buttes03@100114_093819
- OB40Grasshopper_Flat13@100114_093819
- OB40Gregory_Creek38@100114_093819
- OB40Guadalupe_Victoria02@100114_093819
- OB40Inman_Creek14@100114_093819
- OB40KES_276_18@100114_093819
- OB40KES_362_17@100114_093819
- OB40La_Joya16@100114_093819
- OB40McDaniel_Tank21@100114_093819
- OB40Meydan_Tepe36@100114_093819
- OB40Mono_Craters07@100114_093819
- OB40Mule_Creek19@100114_093819
- OB40Obsidian_Cliffs39@100114_093819
- OB40Pachuca30@100114_093819
- OB40Paredon34@100114_093819
- OB40Polvadera31@100114_093819
- OB40RS_Hill08@100114_093819

Comment: _____ Name: _____

Automatic evaluation 1/23/2013 10:54:28 AM

Measurement Corrections Identification Quantification

Line markers
 Preset list
 Automatic

Ok Cancel Help

E: 30.77 keV Cnts: 1321 User: Administrator OFFLINE

10:40 AM 1/10/2014

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Method Editor

Comment: Name: GiveMethodAName

Add

Replace

Remove

Add method to the list

1/10/2014 10:44:36 AM

Quantification

Net elements

	B	C	N	O	F												
	Al	Si	P	S	Cl												
	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br						
	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I						
	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At					
	Fr	Ra	Ac	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
				Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Next, enter a name for the method you have created

Click 'Add' to include it in available methods for Artax

Ok Cancel Help

E: 30.77 keV Cnts: 1321 User: Administrator OFFLINE

10:44 AM 1/10/2014

Bayesian Deconvolution

OB40Archibarca35@100114_093819

File Measurement Analyze Spectrum Project Options Device Export User ?

OB40Archibarca35@100114_093819 Live Time: 10 s GiveMethodAName

New project x Spectrum Parameter Project Scan Show periodic table of the elements (Ctrl+T)

Points YourNameHere

- OB40Archibarca35@100114_093819
- OB40Basaltic_Plateau20@100114_093819
- OB40Big_Southern_Butte06@100114_093819
- OB40Blue_Mountain04@100114_093819
- OB40Burns_Green15@100114_093819
- OB40Cannonball1_22@100114_093819
- OB40Casa_Diablo10@100114_093819
- OB40Cerro_del_Medio28@100114_093819
- OB40Chickahominy26@100114_093819
- OB40Cougar_Mountain29@100114_093819
- OB40Davis_Creek27@100114_093819
- OB40East_Medicine_lake12@100114_093819
- OB40El_Paraiso24@100114_093819
- OB40El_Peceno40@100114_093819
- OB40Glass_Buttes03@100114_093819
- OB40Grasshopper_Flat13@100114_093819
- OB40Gregory_Creek38@100114_093819
- OB40Guadalupe_Victoria02@100114_093819
- OB40Inman_Creek14@100114_093819
- OB40KES_276_18@100114_093819
- OB40KES_362_17@100114_093819
- OB40La_Joya16@100114_093819
- OB40McDaniel_Tank21@100114_093819
- OB40Meydan_Tepe36@100114_093819
- OB40Mono_Craters07@100114_093819
- OB40Mule_Creek19@100114_093819
- OB40Obsidian_Cliffs39@100114_093819
- OB40Pachuca30@100114_093819
- OB40Paredon34@100114_093819
- OB40Polvadera31@100114_093819
- OB40RS_Hill08@100114_093819

x 1E3 Pulses

3.0

2.0

1.0

0.0

0 10 20 30 40

- keV -

Now, we are ready to analyze the spectra. Click on the Periodic Table Button, it will look like a series of lines

E: 30.77 keV Cnts: 1321 User: Administrator OFFLINE

10:46 AM 1/10/2014

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
66	Dy	L-Alpha 2	6.4570
26	Fe	K-Alpha 1	6.4052
63	Eu	L-Beta 1	6.4584
26	Fe	K-Alpha 2	6.3921

If you click on a spectral peak, the black line will move there

The black line then indicates the elements with known fluorescence in that area of the spectrum

E: 6.43 keV Cnts: 2544 User: Administrator OFFLINE

10:55 AM 1/10/2014

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
38	Sr	K-Alpha 1	14.1650
36	Kr	K-Beta 1	14.1116
38	Sr	K-Alpha 2	14.0980

Click on 'Strontium'

A blue line will appear, this is your bayesian deconvolution that includes this element

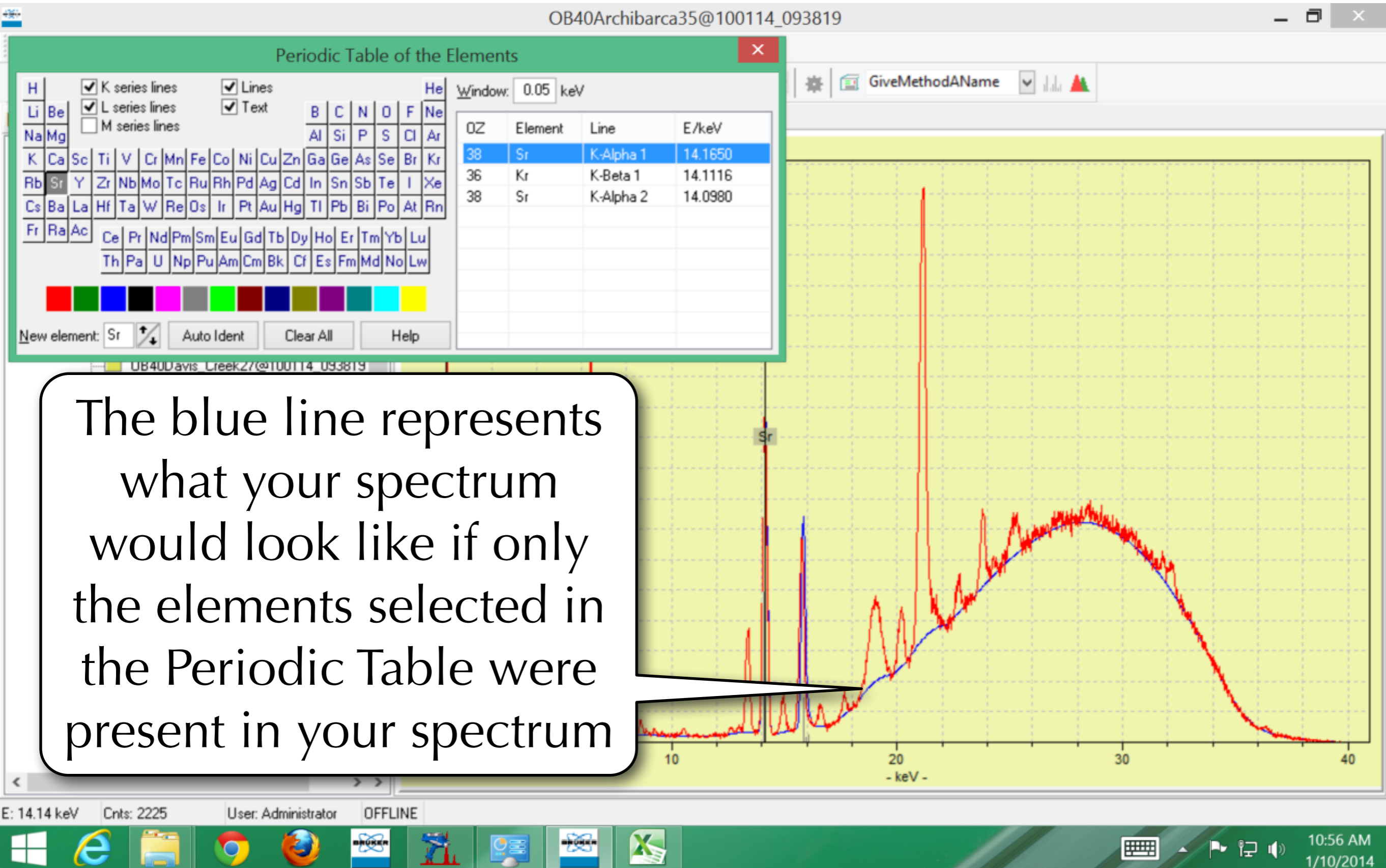
OB40Davis Creek27@100114_093819

OB40Pachuca30@100114_093819
OB40Paredon34@100114_093819
OB40Polvadera31@100114_093819
OB40RS_Hill08@100114_093819

E: 14.14 keV Cnts: 2225 User: Administrator OFFLINE

10:56 AM 1/10/2014

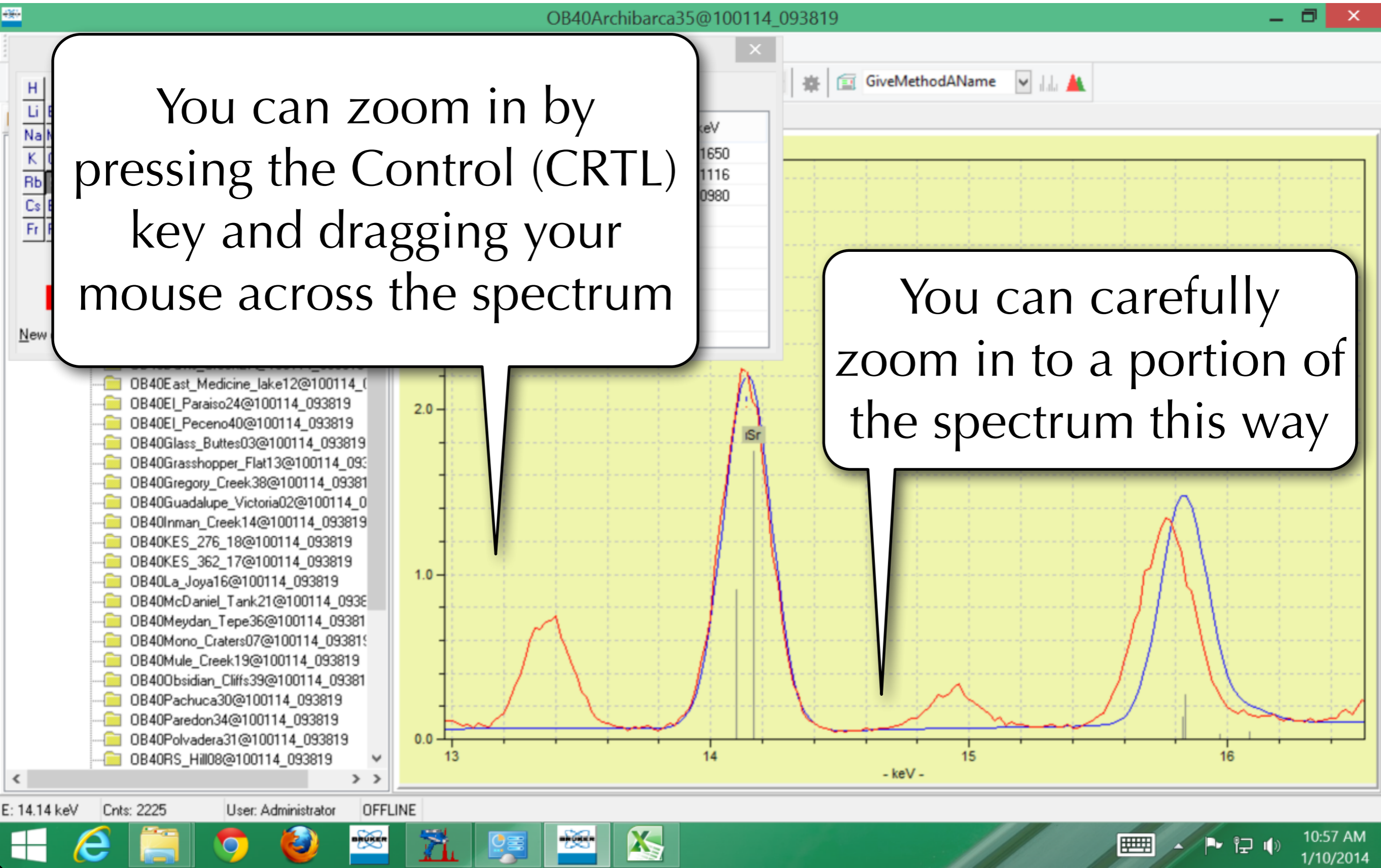
Bayesian Deconvolution



Bayesian Deconvolution

You can zoom in by pressing the Control (CTRL) key and dragging your mouse across the spectrum

You can carefully zoom in to a portion of the spectrum this way



Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

K series lines Lines
 L series lines Text
 M series lines

OZ	Element	Line	E/keV
38	Sr	K-Alpha 1	14.1650
36	Kr	K-Beta 1	14.1116
38	Sr	K-Alpha 2	14.0980

New element: Sr Auto Ident Clear All Help

OB40Davis_Creek27@100114_093819
OB40East_Medicine_lake12@100114_093819
OB40El_Paraiso24@100114_093819
OB40El_Peceno40@100114_093819
OB40Glass_Buttas03@100114_093819
OB40Grasshopper_Flat13@100114_093819
OB40Gregory_Creek38@100114_093819
OB40Guadalupe_Victoria02@100114_093819
OB40Inman_Creek14@100114_093819
OB40KES_276_18@100114_093819
OB40KES_362_17@100114_093819
OB40La_Joya16@100114_093819
OB40McDaniel_Tank21@100114_093819
OB40Meydan_Tepe36@100114_093819
OB40Mono_Craters07@100114_093819
OB40Mule_Creek19@100114_093819
OB40Obsidian_Cliffs39@100114_093819
OB40Pachuca30@100114_093819
OB40Paredon34@100114_093819
OB40Polvadera31@100114_093819
OB40RS_Hill08@100114_093819

2.0
1.0
0.0

13 14 15 16

- keV -

E: 14.14 keV Cnts: 2225 User: Administrator OFFLINE

10:58 AM 1/10/2014

If you just drag the mouse left and right below the X-axis, you can move along the spectrum

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
40	Zr	K-Alpha 1	15.7750
89	Ac	L-Beta 1	15.7130

GiveMethodAName

2.0

Sr

13 14 15 16

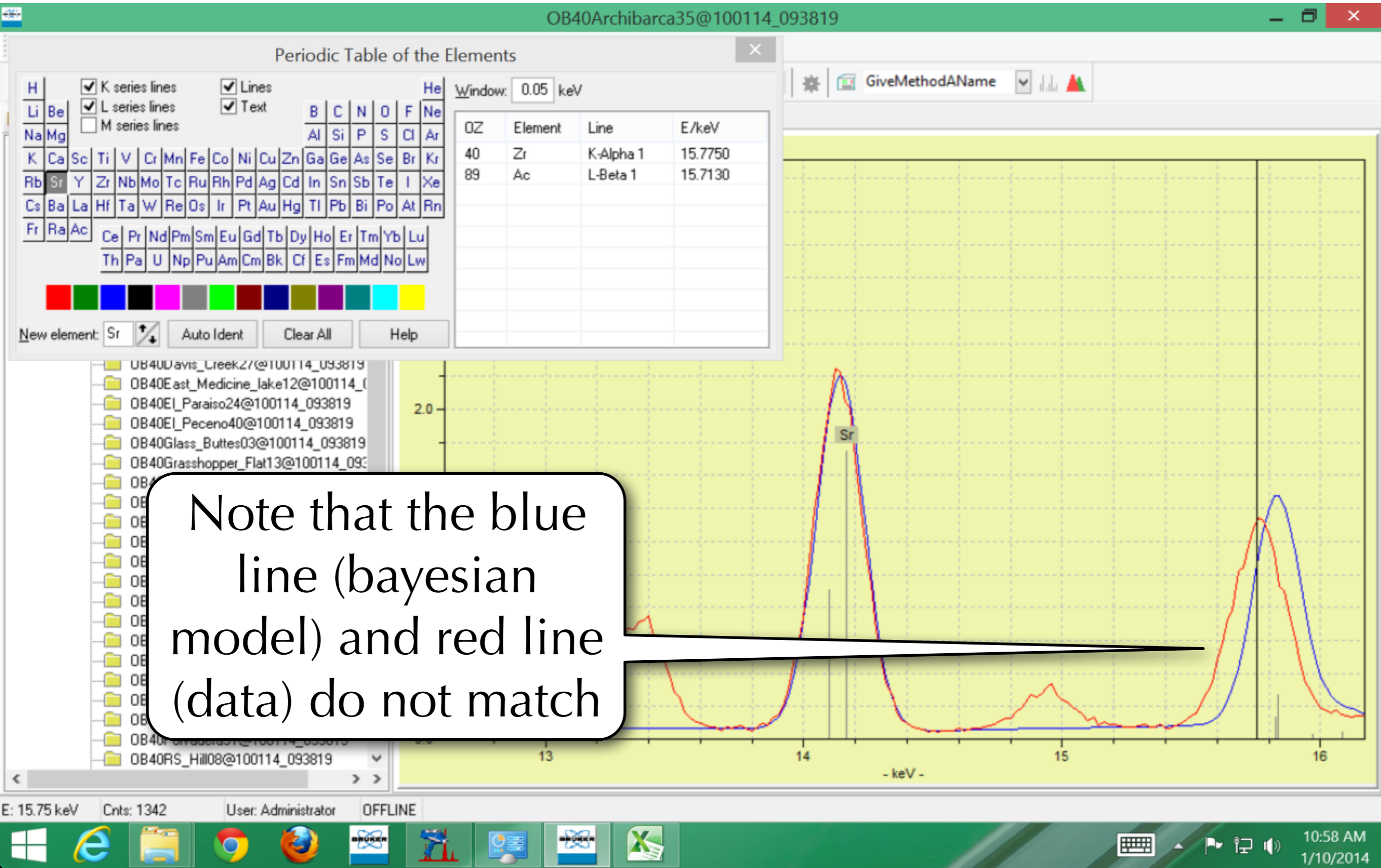
- keV -

E: 15.75 keV Cnts: 1342 User: Administrator OFFLINE

10:58 AM 1/10/2014

Move the cursor, and new elements appear in the Periodic Table

Bayesian Deconvolution



Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
40	Zr	K-Alpha 1	15.7750
89	Ac	L-Beta 1	15.7130

GiveMethodAName

The Periodic Table indicates that this may be Zirconium

OB40Davis_Creek27@100114_093819
OB40East_Medicine_lake12@100114_093819
OB40El_Paraiso24@100114_093819
OB40El_Peceno40@100114_093819
OB40Glass_Buttess03@100114_093819
OB40Grasshopper_Flat13@100114_093819
OB40Gregory_Creek38@100114_093819
OB40Guadalupe_Victoria02@100114_093819
OB40Inman_Creek14@100114_093819
OB40KES_276_18@100114_093819
OB40KES_362_17@100114_093819
OB40La_Joya16@100114_093819
OB40McDaniel_Tank21@100114_093819
OB40Meydan_Tepe36@100114_093819
OB40Mono_Craters07@100114_093819
OB40Mule_Creek19@100114_093819
OB40Obsidian_Cliffs39@100114_093819
OB40Pachuca30@100114_093819
OB40Paredon34@100114_093819
OB40Polvadera31@100114_093819
OB40RS_Hill08@100114_093819

E: 15.75 keV Cnts: 1342 User: Administrator OFFLINE

10:58 AM 1/10/2014

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
40	Zr	K-Alpha 1	15.7750
89	Ac	L-Beta 1	15.7130

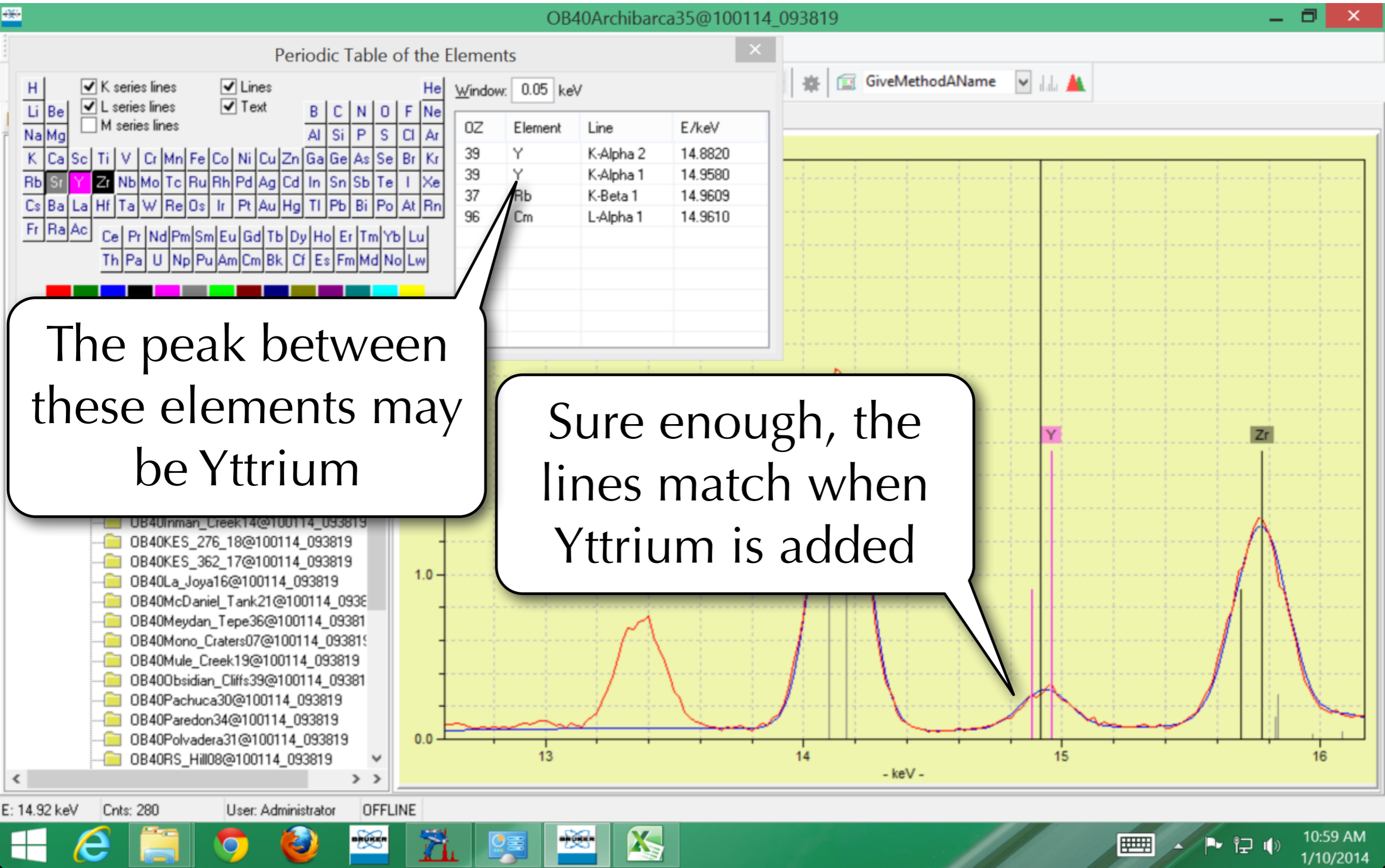
Zirconium can be clicked in the Periodic Table

And now the blue bayesian deconvolution and your data match

E: 15.75 keV Cnts: 1342 User: Administrator OFFLINE

10:59 AM 1/10/2014

Bayesian Deconvolution



Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
37	Rb	K-Alpha 2	13.3360
37	Rb	K-Alpha 1	13.3960
84	Po	L-Beta 2	13.3140

The peak to the left may be Rubidium

When selected, the Bayesian deconvolution curve matches again

E: 13.36 keV Cnts: 712 User: Administrator OFFLINE

11:00 AM 1/10/2014

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
89	Ac	L-Alpha 1	12.6520
36	Kr	K-Alpha 1	12.6476
82	Pb	L-Beta 1	12.6140

Th

Auto Ident Clear All Help

UB40Davis_Creek27@100114_093819
UB40East_Medicine_lake12@100114_093819
UB40El_Paraiso24@100114_093819
UB40El_Peceno40@100114_093819
UB40Glass_Buttess03@100114_093819
UB40Grasshopper_Flat13@100114_093819
UB40Gregory_Creek38@100114_093819
UB40Guadalupe_Victoria02@100114_093819
UB40Inman_Creek14@100114_093819
UB40KES_276_18@100114_093819
UB40KES_362_17@100114_093819
UB40La_Joya16@100114_093819
UB40McDaniel_Tank21@100114_093819
UB40Meydan_Tepe36@100114_093819
UB40Mono_Craters07@100114_093819
UB40Mule_Creek19@100114_093819
UB40Obsidian_Cliffs39@100114_093819
UB40Pachuca30@100114_093819
UB40Paredon34@100114_093819
UB40Polvadera31@100114_093819
UB40RS_Hill08@100114_093819

E: 12.66 keV Cnts: 97 User: Administrator OFFLINE

11:00 AM 1/10/2014

The next element may match Thorium, but it doesn't quite match

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
36	Kr	K-Alpha 1	12.6476
89	Ac	L-Alpha 1	12.6520
82	Pb	L-Beta 1	12.6140
82	Pb	L-Beta 2	12.6007
36	Kr	K-Alpha 2	12.5951

When the next peak over, Lead, is selected, the Bayesian deconvolution and our data agree again

E: 12.64 keV Cnts: 90 User: Administrator OFFLINE

11:01 AM 1/10/2014

Bayesian Deconvolution

The screenshot displays a software interface for Bayesian Deconvolution. The main window is titled "OB40Archibarca35@100114_093819". A "Method Editor" dialog box is open, showing a list of methods: Flores, Forensik1, Forensik2, Forensik3, Gems Test, Geology Test, and GiveMethodAName (highlighted). The "Name" field is set to "GiveMethodAName". The "Automatic evaluation" checkbox is checked. The "Elements for identification" section shows a periodic table with a "Get elements" button. The "Spectrum" plot shows a spectrum with peaks labeled "Y" and "Zr". The "Y" peak is at approximately 15.5 keV and the "Zr" peak is at approximately 16.5 keV. The plot shows a blue curve representing the measured spectrum and a red curve representing the deconvoluted spectrum. The "Y" peak is marked with a pink vertical line and the "Zr" peak is marked with a black vertical line. The x-axis is labeled with 15 and 16. The status bar at the bottom shows "E: 12.64 keV", "Cnts: 90", "User: Administrator", and "OFFLINE". The system tray shows the date and time: "11:01 AM 1/10/2014".

Method Editor

Comment: Name: GiveMethodAName

Flores
Forensik1
Forensik2
Forensik3
Gems Test
Geology Test
GiveMethodAName

Automatic evaluation 1/10/2014 10

Measurement Corrections Identification Quantification

Line markers
 Preset list
 Automatic

Elements for identification

Get elements

Y Zr

15 16

E: 12.64 keV Cnts: 90 User: Administrator OFFLINE

11:01 AM 1/10/2014

When you have gotten a first set of elements, go back to the Method Editor

Bayesian Deconvolution

OB40Archibarca35@100

File Measurement Analyze Spectrum Project

OB40Archibarca35@100114_093819

New project

Points YourNameHere

- OB40Archibarca35@100114_0938
- OB40Basaltic_Plateau20@100114
- OB40Big_Southern_Butte06@100
- OB40Blue_Mountain04@100114_1
- OB40Burns_Green15@100114_09
- OB40Cannonball1_22@100114_0
- OB40Casa_Diablo10@100114_09
- OB40Cerro_del_Medio28@100114
- OB40Chickahominy26@100114_0
- OB40Cougar_Mountain29@10011
- OB40Davis_Creek27@100114_09
- OB40East_Medicine_lake12@100
- OB40El_Paraiso24@100114_0938
- OB40El_Peceno40@100114_0938
- OB40Glass_Buttess03@100114_09
- OB40Grasshopper_Flat13@10011
- OB40Gregory_Creek38@100114_1
- OB40Guadalupe_Victoria02@100
- OB40Inman_Creek14@100114_09
- OB40KES_276_18@100114_0938
- OB40KES_362_17@100114_0938
- OB40La_Joya16@100114_093819
- OB40McDaniel_Tank21@100114_
- OB40Meydan_Tepe36@100114_0
- OB40Mono_Craters07@100114_0
- OB40Mule_Creek19@100114_093
- OB40Obsidian_Cliffs39@100114_0
- OB40Pachuca30@100114_09381
- OB40Paredon34@100114_093819
- OB40Polvadera31@100114_0938
- OB40RS_Hill08@100114_093819

Method Editor

Comment: Name: GiveMethodAName

Flores
Forensik1
Forensik2
Forensik3
Gems Test
Geology Test
GiveMethodAName

Automatic evaluation 1/10/2014 10

Measurement Corrections Identification Quantification

Elements for identification

Line markers
 Preset list
 Automatic

Get elements

H																			He
Li	Be													B	C	N	O	F	Ne
Na	Mg													Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr		
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe		
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn		
Fr	Ra	Ac																	
			Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu			
			Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lw			

Ok Cancel Help

Sr Y

15

Click 'Get Elements' in the 'Identification' tab to import the elements you've selected to your method

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Method Editor

Comment: Name: GiveMethodAName

Flores
Forensik1
Forensik2
Forensik3
Gems Test
Geology Test
GiveMethodAName

Add
Replace
Remove Replaces selected method

Click 'Replace' to switch out your blank method with the one that now has elements

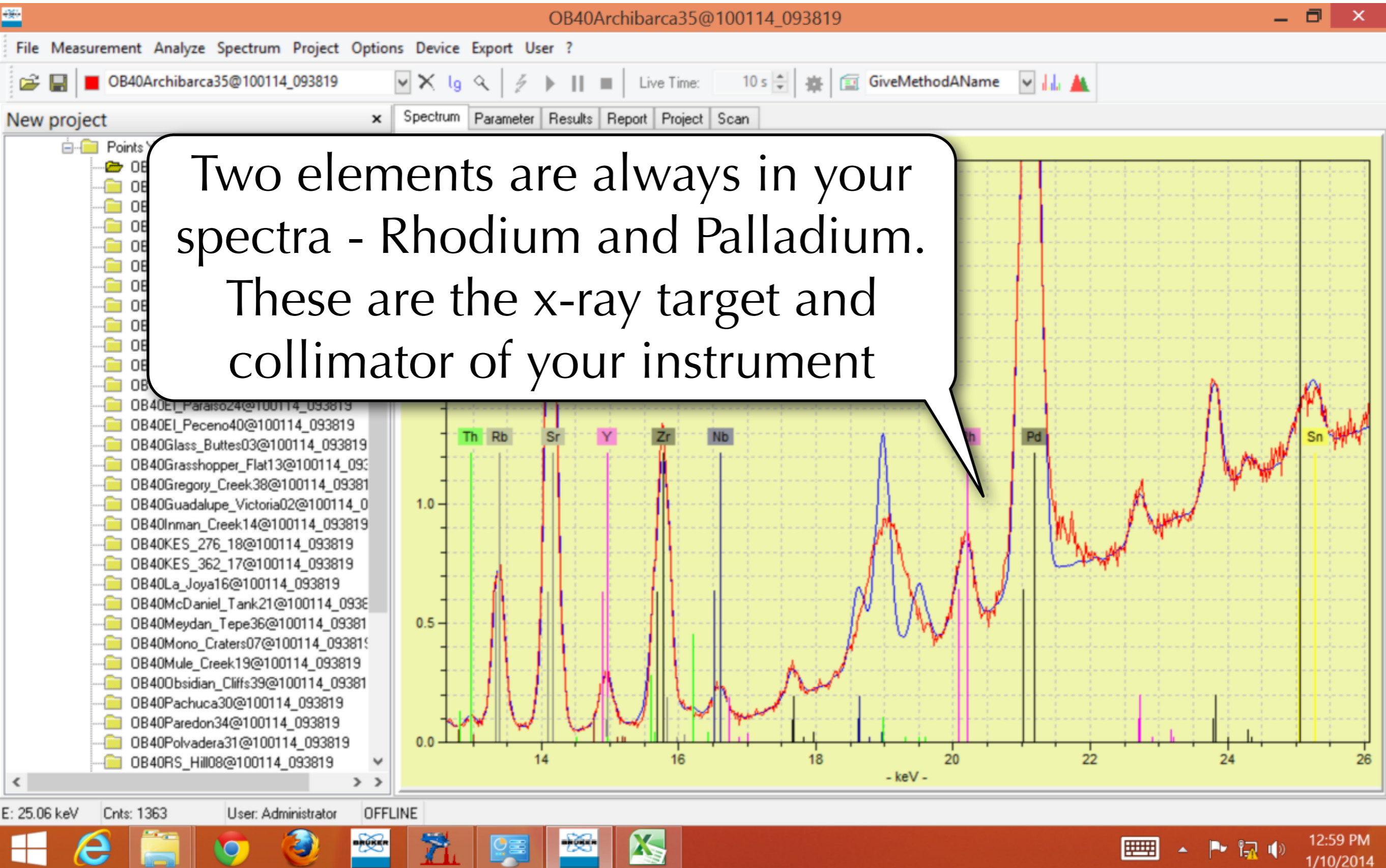
Click 'Ok' when done

Ok Cancel Help

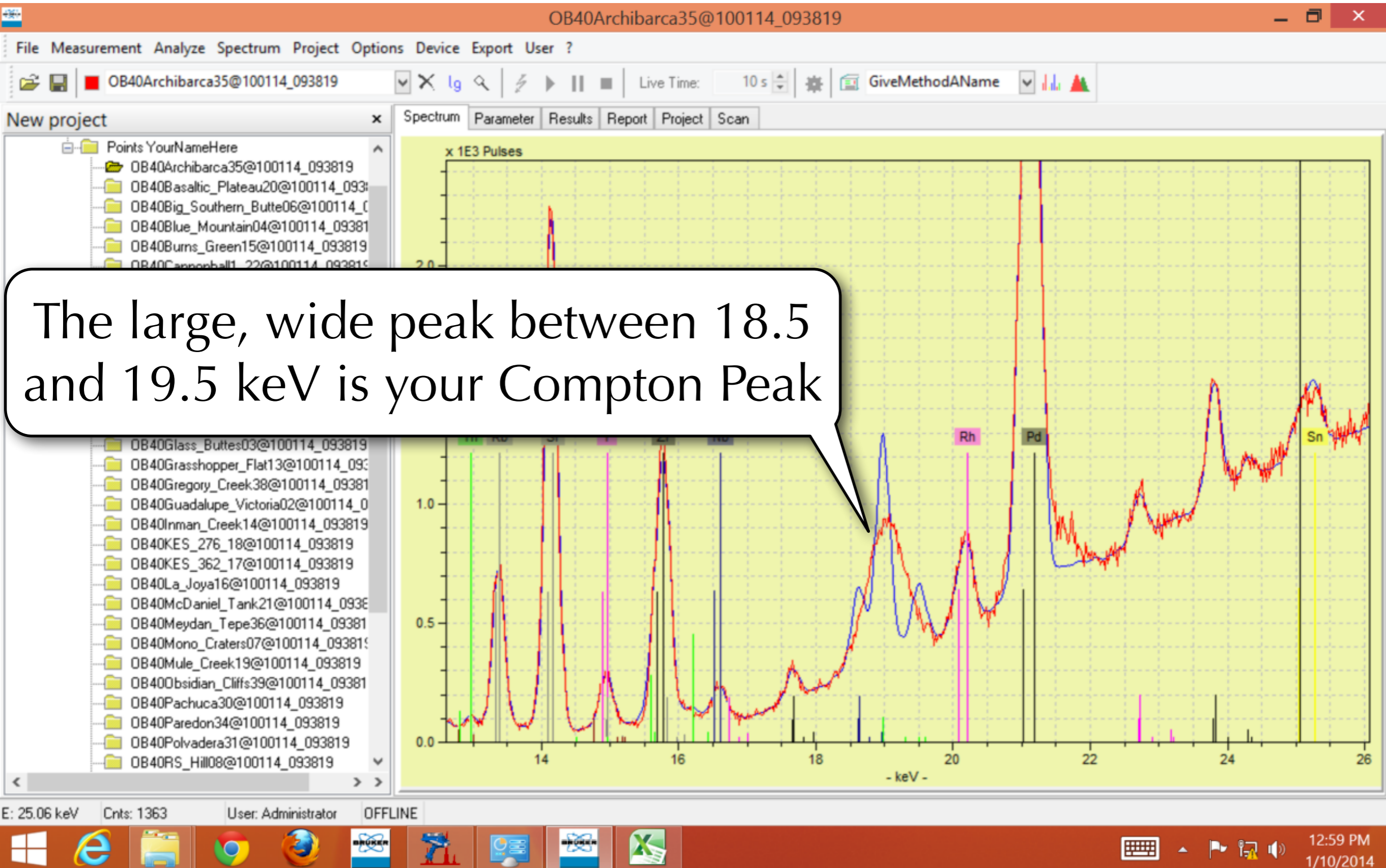
15

11:04 AM 1/10/2014

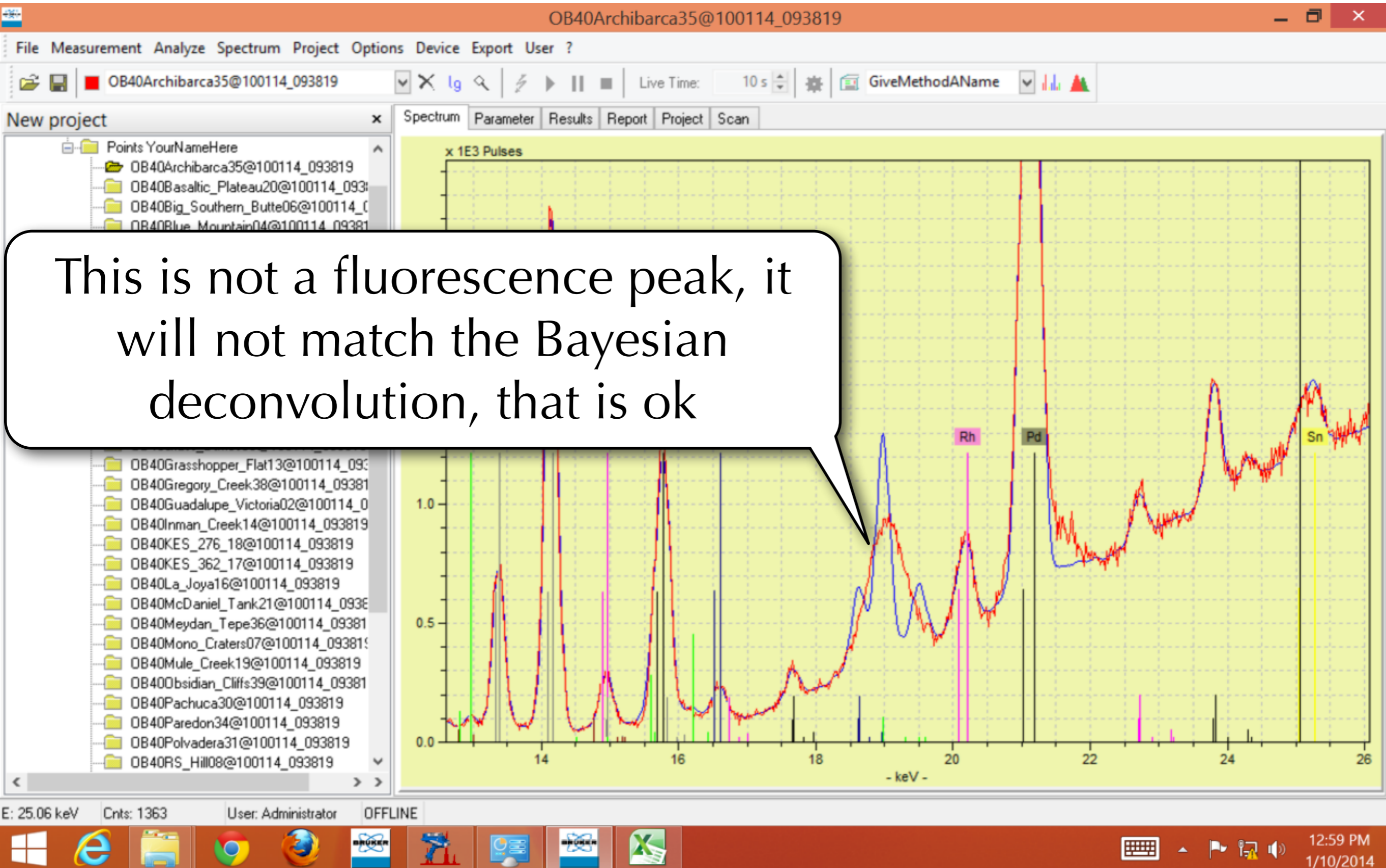
Bayesian Deconvolution



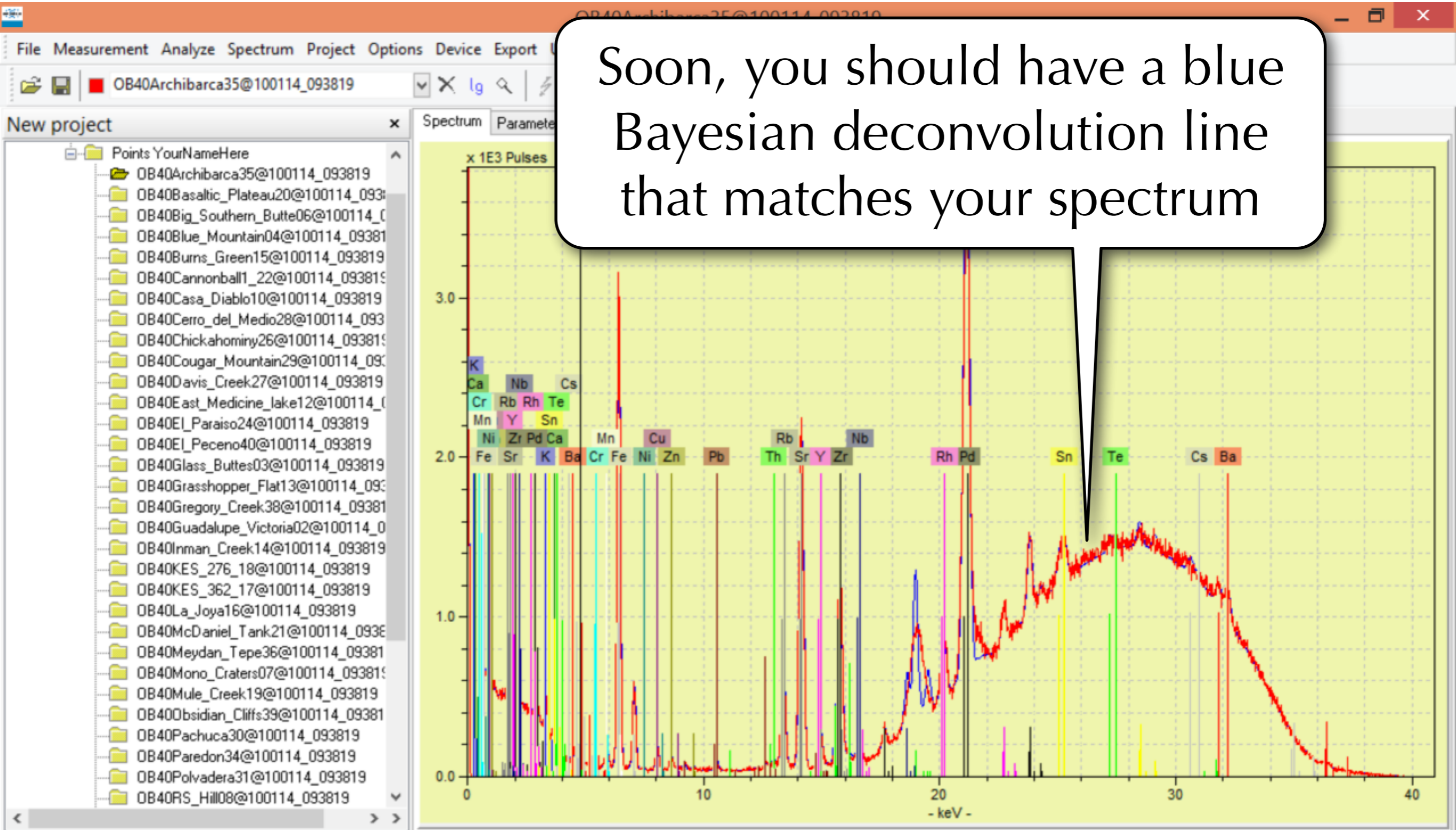
Bayesian Deconvolution



Bayesian Deconvolution



Bayesian Deconvolution



Soon, you should have a blue Bayesian deconvolution line that matches your spectrum

Bayesian Deconvolution

Go back to the 'Methods Editor' and add the new elements by clicking 'Get Elements'

The screenshot displays the 'Methods Editor' window of a software application. The window is titled 'OB40Archibarca35@100114_093819' and has a menu bar with 'File', 'Measurement', 'Analyze', 'Spectrum', and 'Project'. The main area is divided into several sections:

- Left Panel:** A file explorer showing a folder structure under 'Points YourNameHere' with numerous subfolders named 'OB40...'.
- Top Section:** Fields for 'Comment:' and 'Name:', a 'GiveMethodAN' dropdown menu, and a date/time stamp '1/10/2014 10:44:36 AM'. There is a checked box for 'Automatic evaluation'.
- Identification Section:** A tabbed interface with 'Measurement', 'Corrections', 'Identification', and 'Quantification'. Under 'Identification', there are radio buttons for 'Line markers', 'Preset list' (selected), and 'Automatic'.
- Periodic Table:** A table of elements for identification. A 'Get elements' button is overlaid on the table. The elements 'Cr', 'Mn', 'Fe', 'Co', 'Ni', 'Cu', 'Zn', 'Ga', 'Ge', 'As', 'Se', 'Br', 'Kr', 'Rb', 'Sr', 'Y', 'Zr', 'Nb', 'Mo', 'Tc', 'Ru', 'Rh', 'Pd', 'Ag', 'Cd', 'In', 'Sn', 'Sb', 'Te', 'I', 'Xe', 'Cs', 'Ba', 'La', 'Hf', 'Ta', 'W', 'Re', 'Os', 'Ir', 'Pt', 'Au', 'Hg', 'Tl', 'Pb', 'Bi', 'Po', 'At', 'Rn', 'Fr', 'Ra', 'Ac', 'Ce', 'Pr', 'Nd', 'Pm', 'Sm', 'Eu', 'Gd', 'Tb', 'Dy', 'Ho', 'Er', 'Tm', 'Yb', 'Lu', 'Th', 'Pa', 'U', 'Np', 'Pu', 'Am', 'Cm', 'Bk', 'Cf', 'Es', 'Fm', 'Md', 'No', 'Lw' are highlighted in blue.
- Right Panel:** A spectrum plot showing a red curve with several peaks. Vertical lines are drawn at specific energy levels, labeled with element symbols: Th (green), Rb (black), Sr (black), and Y (pink). The x-axis has markers at 12 and 14.

At the bottom of the window, there is a status bar with 'E: 6.60 keV', 'Cnts: 79', 'User: Administrator', and 'OFFLINE'. The Windows taskbar is visible at the very bottom, showing the Start button, Internet Explorer, File Explorer, Chrome, Firefox, and several instances of the Bruker software.

Bayesian Deconvolution

OB40Archibarca35@100114_093819

Method Editor

Comment: Name: GiveMethodAName

Flores
Forensik1
Forensik2
Forensik3
Gems Test
Geology Test
GiveMethodAName

Automatic evaluation 1/10/2014 10:44:36 AM

Measurement Corrections Identification Quantification

Elements for identification

Line markers
 Preset list
 Automatic

Get elements

H																He		
Li	Be									B	C	N	O	F	Ne			
Na	Mg									Al	Si	P	S	Cl	Ar			
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra	Ac																
					Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
					Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lw

This is an iterative process, you do this until you have the fewest elements that can re-create your spectra

Th Rb Sr Y

E: 6.60 keV Cnts: 79 User: Administrator OFFLINE

1/10/2014 1:02 PM

Bayesian Deconvolution

OB40KES_362_17@100114_093819

File Measurement Analyze Spectrum Project Options Device Export User ?

OB40KES_362_17@100114_093819

Live Time: 10 s GiveMethodAName

New project

- OB40Burns_Green15@100114_093819
- OB40Cannonball1_22@100114_093819
- OB40Casa_Diablo10@100114_093819
- OB40Cerro_del_Medio28@100114_093819
- OB40Chickahominy26@100114_093819
- OB40Cougar_Mountain29@100114_093819
- OB40Davis_Creek27@100114_093819
- OB40East_Medicine_lake12@100114_093819
- OB40El_Paraiso24@100114_093819
- OB40El_Peceno40@100114_093819
- OB40Glass_Buttes03@100114_093819
- OB40Grasshopper_Flat13@100114_093819
- OB40Gregory_Creek38@100114_093819
- OB40Guadalupe_Victoria02@100114_093819
- OB40Inman_Creek14@100114_093819
- OB40KES_362_17@100114_093819**
- OB40La_Joya16@100114_093819
- OB40McDaniel_Tank21@100114_093819
- OB40Meydan_Tepe36@100114_093819
- OB40Mono_Craters07@100114_093819
- OB40Mule_Creek19@100114_093819
- OB40Obsidian_Cliffs39@100114_093819
- OB40Pachuca30@100114_093819
- OB40Paredon34@100114_093819
- OB40Polvadera31@100114_093819
- OB40RS_Hill08@100114_093819
- OB40San_Leonel32@100114_093819
- OB40Sarikamis37@100114_093819
- OB40Timber_Butte01@100114_093819
- OB40Tucker_Hill11@100114_093819
- OB40VNN-2_25@100114_093819

Spectrum Parameter Project Scan

Close that spectrum

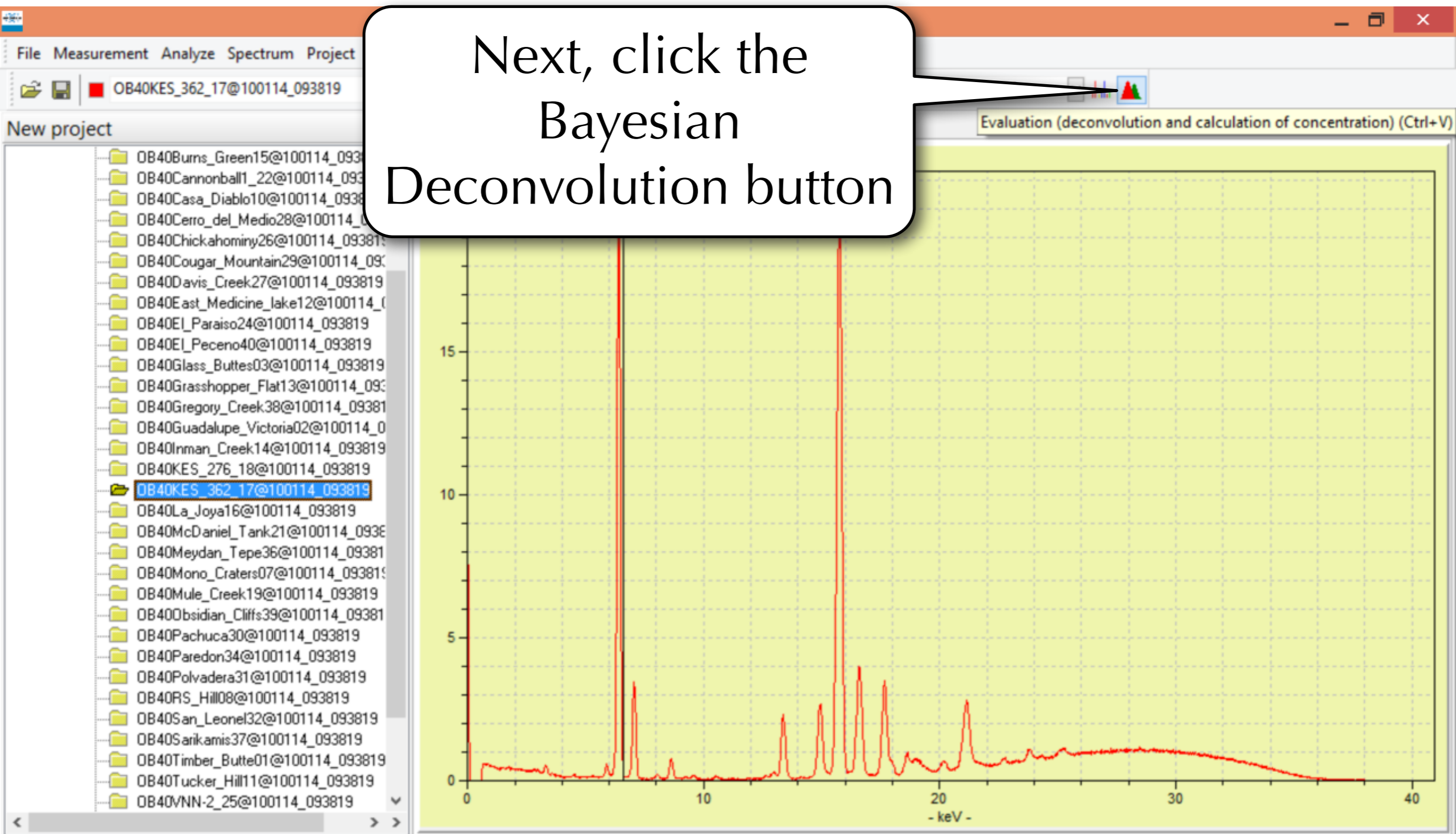
And add a new one to test your method

E: 6.60 keV Cnts: 79 User: Administrator OFFLINE

1:03 PM 1/10/2014

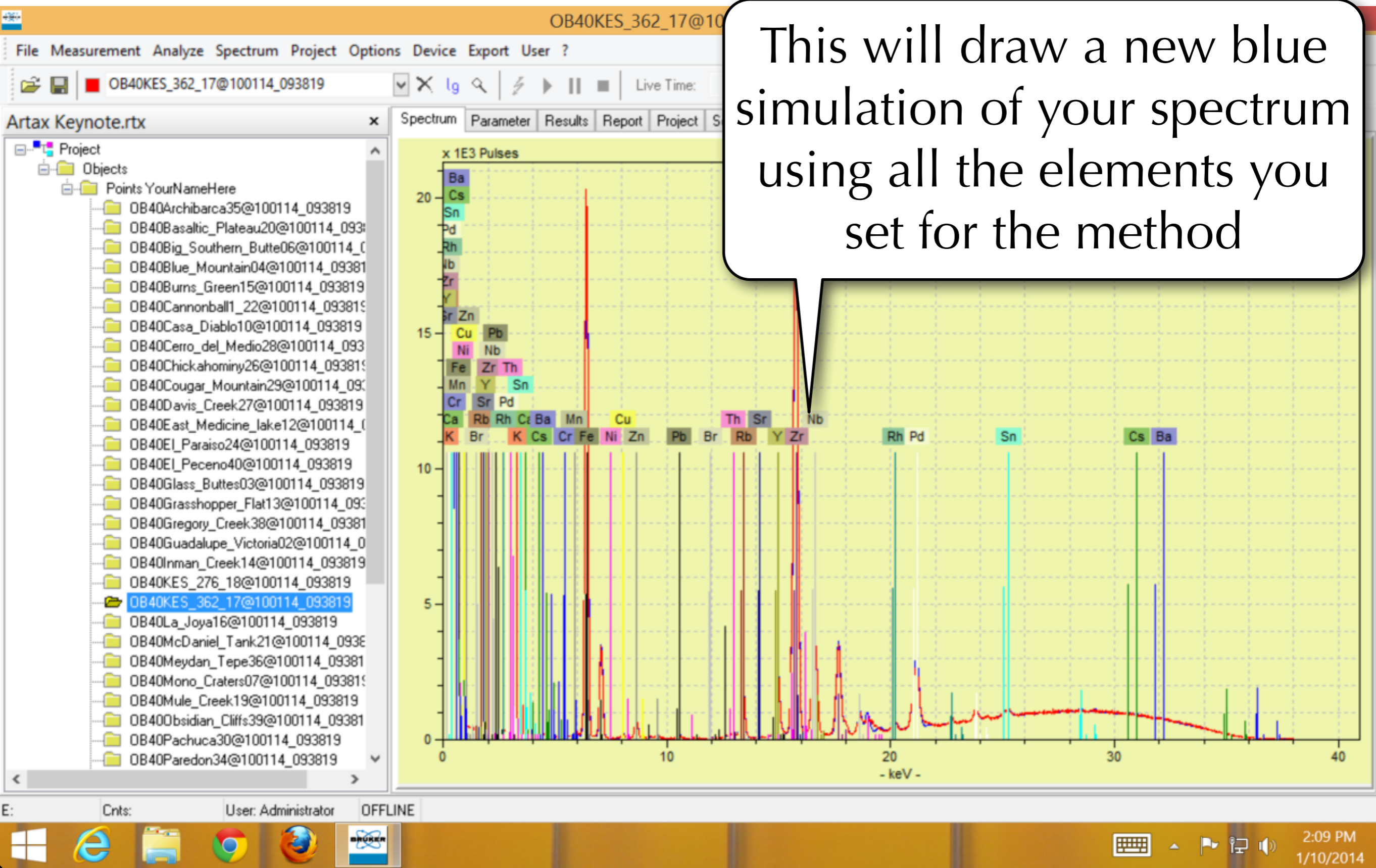
Bayesian Deconvolution

Next, click the Bayesian Deconvolution button



E: 6.60 keV Cnts: 79 User: Administrator OFFLINE

Bayesian Deconvolution



Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
35	Br	K-Alpha 2	11.8780
80	Hg	L-Beta 1	11.8240
87	Fr	L-Alpha 2	11.8950
80	Hg	L-Beta 2	11.9058

Move your cursor to see what elements it could be

Look for mismatches between the red (empirical) and blue (simulation) spectra

E: 11.86 keV Cnts: 100 User: Administrator OFFLINE

1:07 PM 1/10/2014

Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
35	Br	K-Alpha 2	11.8780
80	Hg	L-Beta 1	11.8240
87	Fr	L-Alpha 2	11.8950
80	Hg	L-Beta 2	11.9058

Select the element, Bromine in this case

You will see the blue bayesian simulation match or not match

E: 11.86 keV Cnts: 100 User: Administrator OFFLINE

1:11 PM 1/10/2014

Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

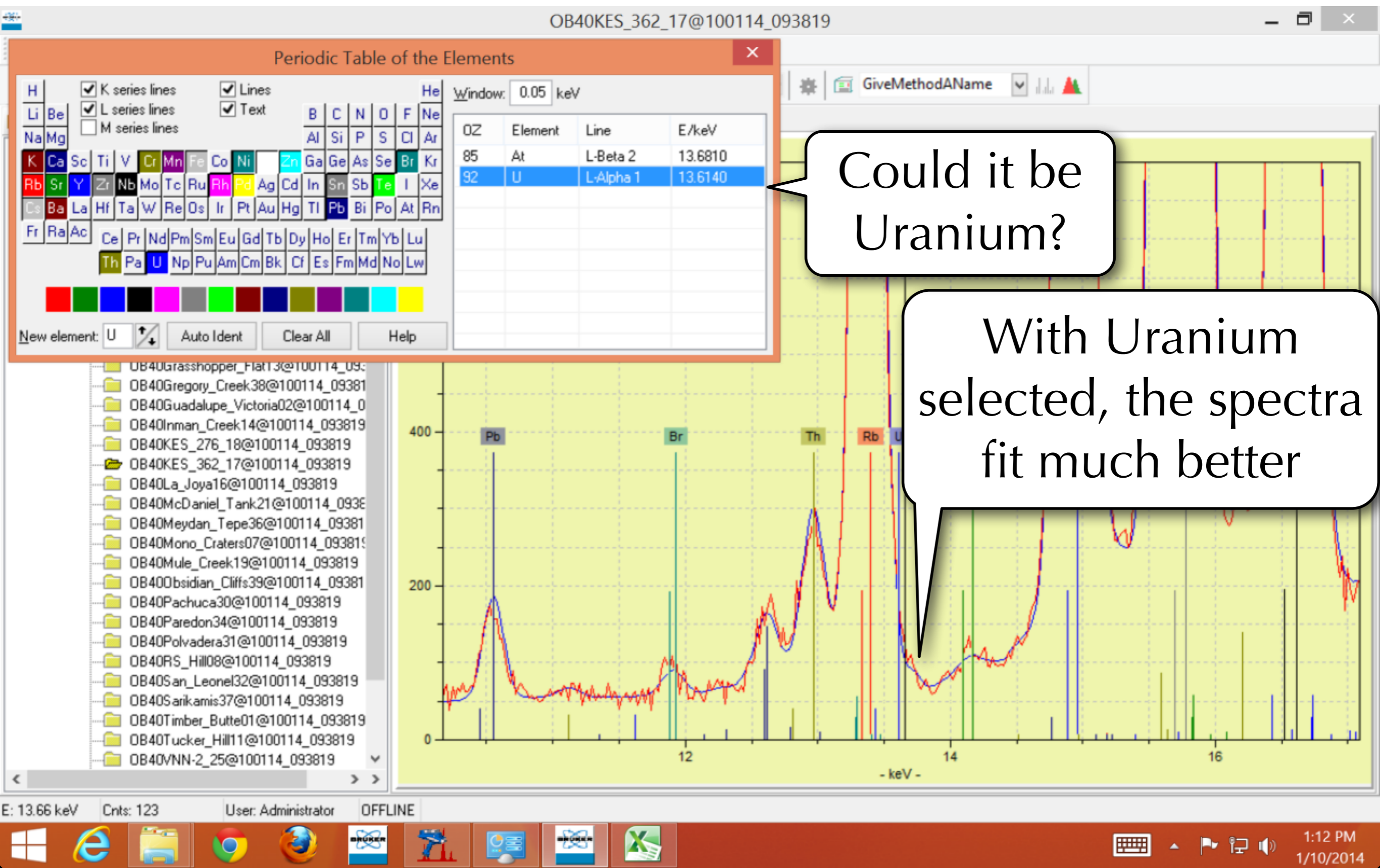
OZ	Element	Line	E/keV
85	At	L-Beta 2	13.6810
92	U	L-Alpha 1	13.6140

Note the slight mismatch between red and blue here

E: 13.66 keV Cnts: 123 User: Administrator OFFLINE

1:11 PM 1/10/2014

Bayesian Deconvolution



Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
85	At	L-Beta 2	13.6810
92	U	L-Alpha 1	13.6140

OB40Grasshopper_Flat13@100114_093819
OB40Gregory_Creek38@100114_093819
OB40Guadalupe_Victoria02@100114_093819
OB40Inman_Creek14@100114_093819
OB40KES_276_18@100114_093819
OB40KES_362_17@100114_093819
OB40La_Joya16@100114_093819
OB40McDaniel_Tank21@100114_093819
OB40Meydan_Tepe36@100114_093819
OB40Mono_Craters07@100114_093819
OB40Mule_Creek19@100114_093819
OB40Obsidian_Cliffs39@100114_093819
OB40Pachuca30@100114_093819
OB40Paredon34@100114_093819
OB40Polvadera31@100114_093819
OB40RS_Hill08@100114_093819
OB40San_Leonel32@100114_093819
OB40Sarikamis37@100114_093819
OB40Timber_Butte01@100114_093819
OB40Tucker_Hill11@100114_093819
OB40VNN-2_25@100114_093819

400
200
0

Pb Br Th

- keV -

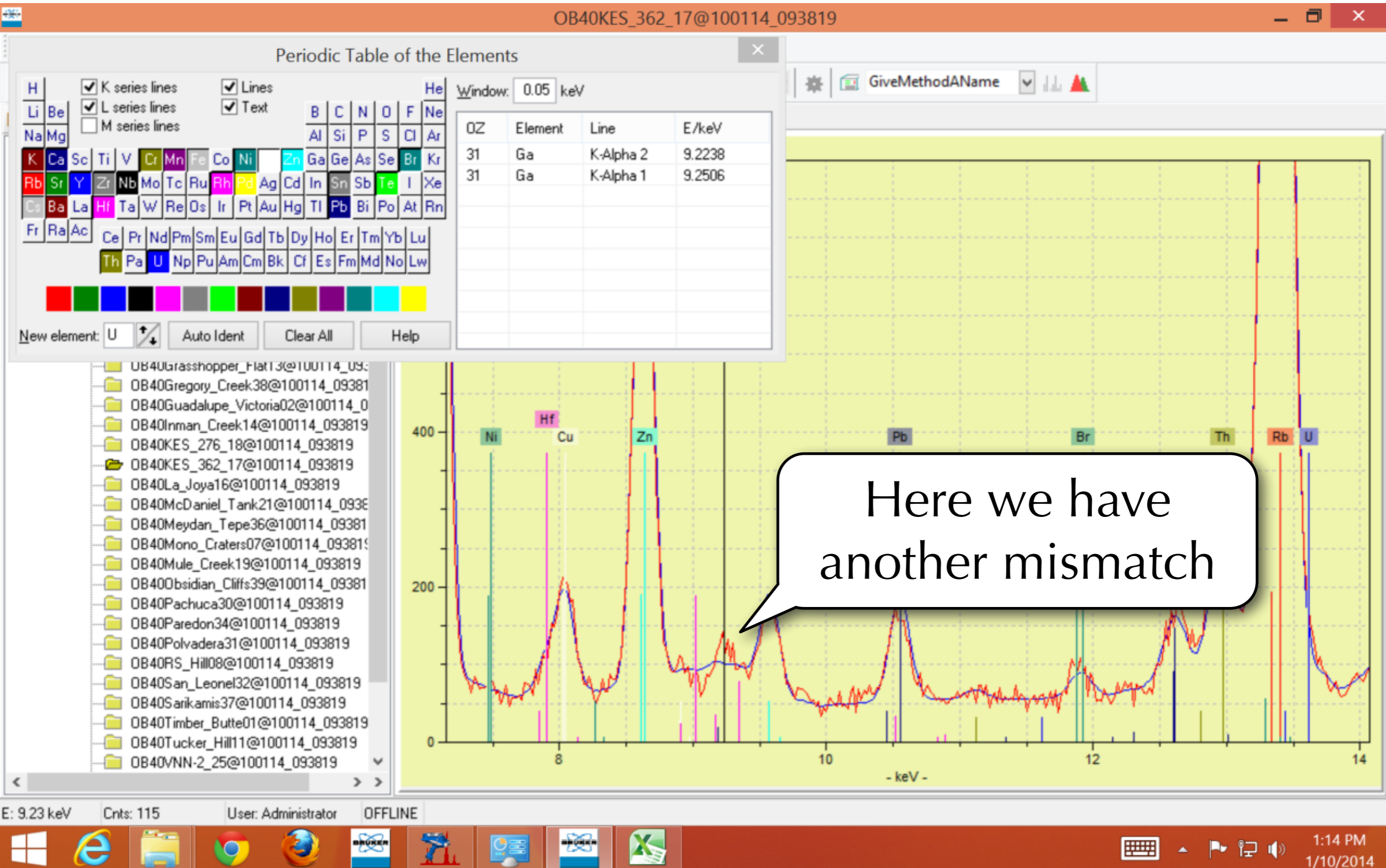
12 14 16

E: 13.66 keV Cnts: 123 User: Administrator OFFLINE

1:12 PM 1/10/2014

We will come back to this later when we analyze the data

Bayesian Deconvolution



Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E ₀
31	Ga	K-Alpha 2	9.25
31	Ga	K-Alpha 1	9.25

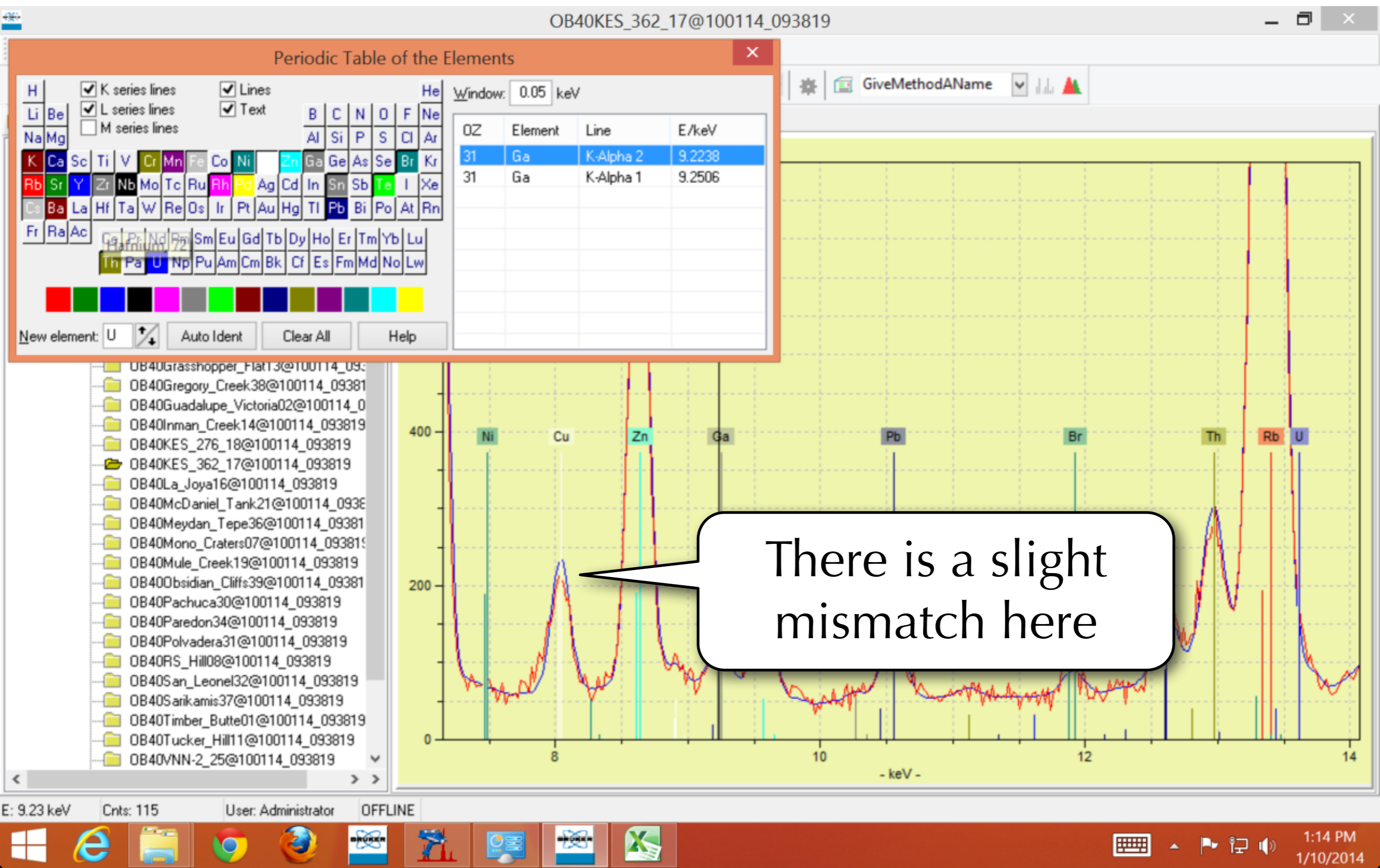
Selecting Gallium, we see that the spectra fit better

OB40Grasshopper_Flat13@100114_093819
OB40Gregory_Creek38@100114_093819
OB40Guadalupe_Victoria02@100114_093819
OB40Inman_Creek14@100114_093819
OB40KES_276_18@100114_093819
OB40KES_362_17@100114_093819
OB40La_Joya16@100114_093819
OB40McDaniel_Tank21@100114_093819
OB40Meydan_Tepe36@100114_093819
OB40Mono_Craters07@100114_093819
OB40Mule_Creek19@100114_093819
OB40Obsidian_Cliffs39@100114_093819
OB40Pachuca30@100114_093819
OB40Paredon34@100114_093819
OB40Polvadera31@100114_093819
OB40RS_Hill08@100114_093819
OB40San_Leonel32@100114_093819
OB40Sarikamis37@100114_093819
OB40Timber_Butte01@100114_093819
OB40Tucker_Hill11@100114_093819
OB40VNN-2_25@100114_093819

E: 9.23 keV Cnts: 115 User: Administrator OFFLINE

1:14 PM 1/10/2014

Bayesian Deconvolution



Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
72	Hf	L-Alpha 1	7.8990
67	Ho	L-Beta 2	7.9110
72	Hf	L-Alpha 2	7.8450

We select Hafnium

And we see they fit better

E: 7.88 keV Cnts: 113 User: Administrator OFFLINE

1:15 PM 1/10/2014

Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
44	Ru	K-Alpha 2	19.1500

GiveMethodAName

Here we have another mismatch

OB40Grasshopper_Flat13@100114_093819
OB40Gregory_Creek38@100114_093819
OB40Guadalupe_Victoria02@100114_093819
OB40Inman_Creek14@100114_093819
OB40KES_276_18@100114_093819
OB40KES_362_17@100114_093819
OB40La_Joya16@100114_093819
OB40McDaniel_Tank21@100114_093819
OB40Meydan_Tepe36@100114_093819
OB40Mono_Craters07@100114_093819
OB40Mule_Creek19@100114_093819
OB40Obsidian_Cliffs39@100114_093819
OB40Pachuca30@100114_093819
OB40Paredon34@100114_093819
OB40Polvadera31@100114_093819
OB40RS_Hill08@100114_093819
OB40San_Leonel32@100114_093819
OB40Sarikamis37@100114_093819
OB40Timber_Butte01@100114_093819
OB40Tucker_Hill11@100114_093819
OB40VNN-2_25@100114_093819

E: 19.17 keV Cnts: 600 User: Administrator OFFLINE

1:18 PM 1/10/2014

Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

OZ	Element	Line	E/keV
44	Ru	K-Alpha 2	19.1500

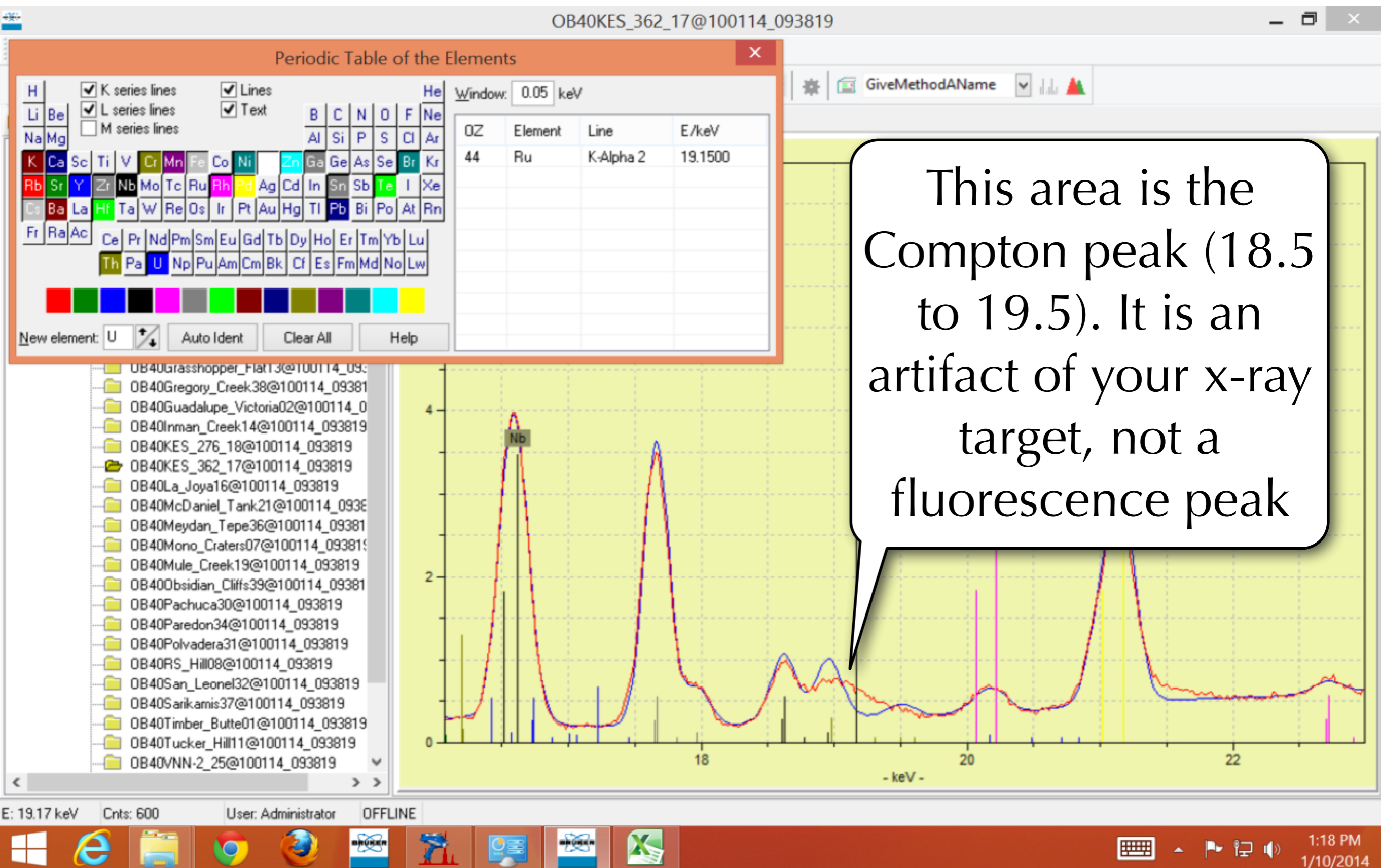
We select Ruthenium

And the spectra do not fit better

E: 19.17 keV Cnts: 600 User: Administrator OFFLINE

1:19 PM 1/10/2014

Bayesian Deconvolution



Bayesian Deconvolution

OB40KES_362_17@100114_093819

Periodic Table of the Elements

Window: 0.05 keV

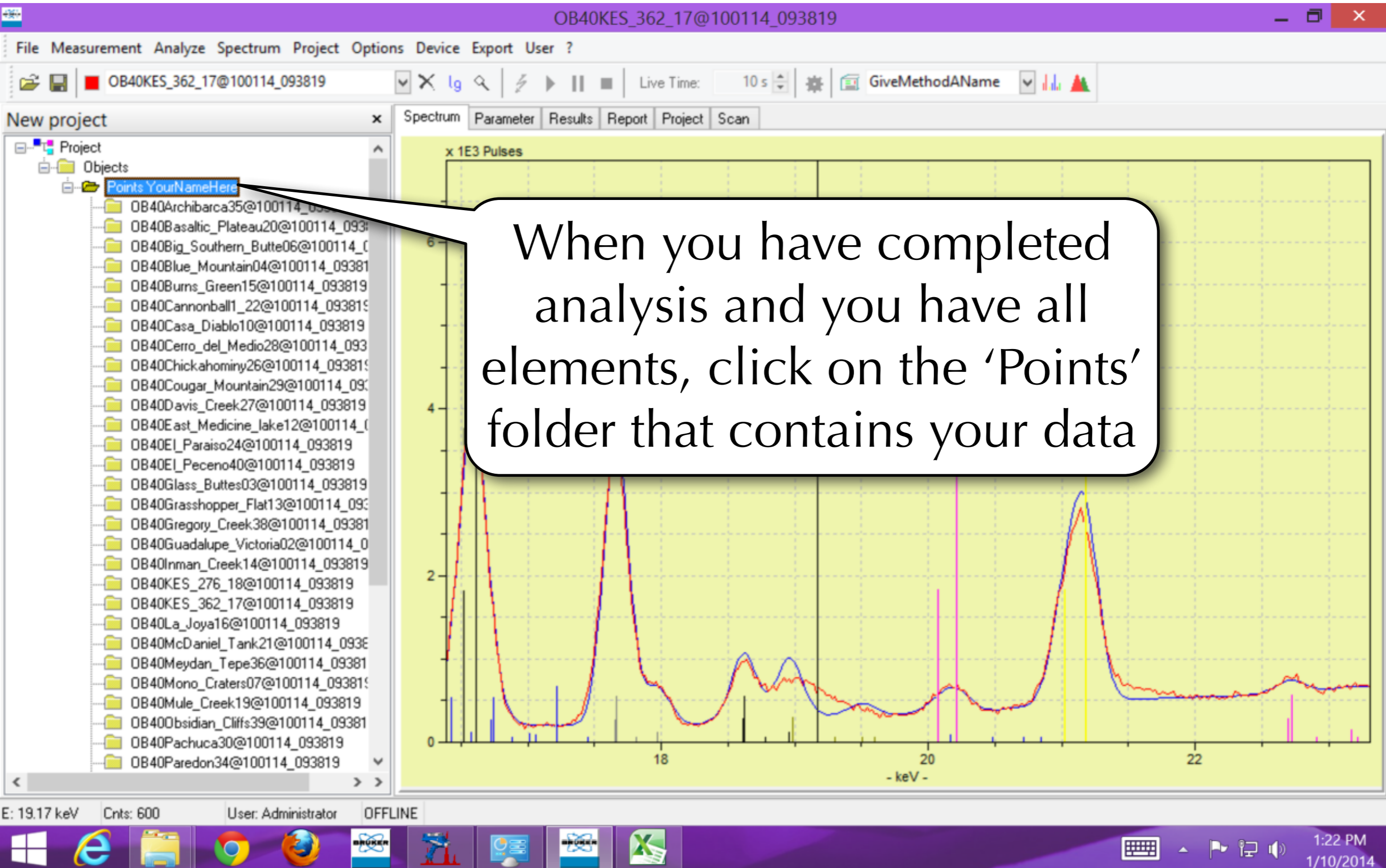
OZ	Element	Line	E/keV
44	Ru	K-Alpha 2	19.1500

The blue and red lines will never match here, and that is fine. It will not impact your data

E: 19.17 keV Cnts: 600 User: Administrator OFFLINE

1:18 PM 1/10/2014

Bayesian Deconvolution



The screenshot displays a software window titled "OB40KES_362_17@100114_093819". The interface includes a menu bar (File, Measurement, Analyze, Spectrum, Project, Options, Device, Export, User ?), a toolbar with icons for file operations and a "Live Time: 10 s" indicator, and a "GiveMethodAName" dropdown. On the left, a "New project" pane shows a tree view of "Objects" with a folder named "Points YourNameHere" highlighted. A callout box points to this folder with the text: "When you have completed analysis and you have all elements, click on the 'Points' folder that contains your data". The main area shows a spectrum plot with the y-axis labeled "x 1E3 Pulses" and the x-axis labeled "- keV -". The plot displays a red data line, a blue fit line, and several vertical lines representing peaks. The x-axis has major ticks at 18, 20, and 22 keV. At the bottom, a status bar shows "E: 19.17 keV", "Cnts: 600", "User: Administrator", and "OFFLINE". The Windows taskbar at the very bottom shows the time as 1:22 PM on 1/10/2014.

Bayesian Deconvolution

The screenshot displays a software interface for Bayesian Deconvolution. The main window shows a spectrum plot with the y-axis labeled 'x 1E3 Pulses' and the x-axis labeled '- keV -'. The plot features two overlaid curves (red and blue) and several peaks. Three peaks are specifically labeled with vertical lines: 'Nb' at approximately 17.5 keV, 'Rh' at approximately 20.3 keV, and 'Pd' at approximately 21.3 keV. The interface includes a menu bar with 'File', 'Measurement', 'Analyze', 'Spectrum', 'Project', 'Options', 'Device', 'Export', and 'User ?'. The 'Analyze' menu is open, showing options like 'Calibrate DCCR...', 'Periodic Table...', 'Evaluation', 'Evaluate Results', 'Accumulate Spectra', 'Match...', and 'Elements...'. A file list on the left side shows various folders, with 'OB40KES_362_17@100114_093819' selected. A status bar at the bottom indicates 'E: 19.17 keV', 'Cnts: 600', 'User: Administrator', and 'OFFLINE'. The Windows taskbar at the very bottom shows the time as 1:23 PM on 1/10/2014.

OB40KES_362_17@100114_093819

File Measurement Analyze Spectrum Project Options Device Export User ?

Calibrate DCCR...
Periodic Table... Ctrl+T
Evaluation Ctrl+V
Evaluate Results
Accumulate Spectra
Match...
Elements...

100114_093819

Spectrum Parameter Results Report Project Scan

x 1E3 Pulses

Nb Rh Pd

2
0 18 20 22
- keV -

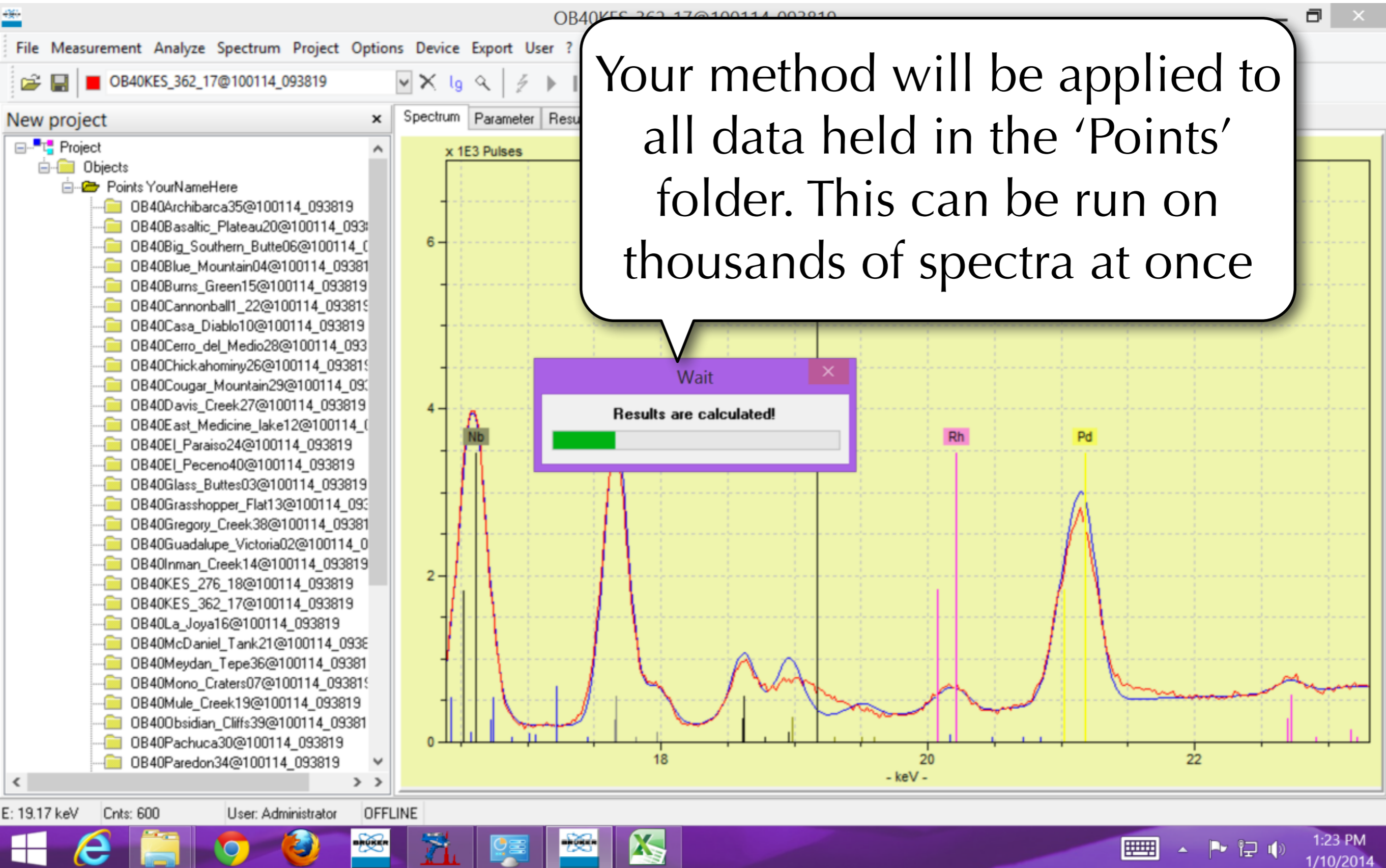
E: 19.17 keV Cnts: 600 User: Administrator OFFLINE

1:23 PM 1/10/2014

With the 'Points' folder selected, click 'Analyze' then 'Evaluate Results'

Bayesian Deconvolution

Your method will be applied to all data held in the 'Points' folder. This can be run on thousands of spectra at once



Bayesian Deconvolution

The screenshot shows a Windows 8.1 Pro desktop with a purple background. A File Explorer window titled 'Artax Session' is open, displaying the contents of the 'Artax Session' folder. The window has a ribbon with 'File', 'Home', 'Share', and 'View' tabs. The address bar shows the path 'Artax Session'. The left sidebar shows 'Favorites' and 'This PC' sections. The main pane shows a list of files and folders:

Name	Date modified	Type	Size
Artax	11/12/2013 7:09 AM	File folder	
Obsidian Cal Data	11/12/2013 7:09 AM	File folder	
.DS_Store	11/12/2013 7:05 AM	DS_STORE File	7 KB
Artax Example Results.xlsx	1/10/2014 1:25 PM	Microsoft Excel Wor...	20 KB

A speech bubble with a black border and white background points to the 'Artax Example Results.xlsx' file. The text inside the speech bubble reads: 'Navigate to where you saved the spreadsheet'.

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

File Home Insert Page Layout Formulas Data Review View Developer

Clipboard Font Alignment Number Styles Cells Editing

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Project:													
2														
3	Ser.No.:													
4														
5	Method:	GiveMethodAName												
6	Measurement													
7	High voltage/kV:	40												
8	Current/ μ A:	38												
9	Time/s:	237												
10	Energy range/keV:	0.0												
11	Anode:													
12	Filter:	Ti/Al/Cu												
13	Optic:	No optic												
14	Atmosphere:	Air												
15	Evaluation													
16	Corrections:	Escape Backgr.												
17	Stripping cycles:	9												
18	Elements:	Ba Br Ca Cr Cs Cu Fe Ga Hf K Mn Nb Ni Pb Pd Rb Rh Sn Sr Te Th U Y Zn Zr												
19	Deconvolution method:	Bayes												

Ready | Parameter Points | 100% | 1:27 PM 1/10/2014

Bayesian Deconvolution

The screenshot shows a Microsoft Excel spreadsheet titled "Artax Example Results.xlsx". The spreadsheet contains a table with the following data:

Project:	
Ser.No.:	
Method:	GiveMethodAName
Measurement	
High voltage/kV:	40
Current/ μ A:	38
Time/s:	237
Energy range/keV:	0.0
Anode:	
Filter:	Ti/Al/Cu
Optic:	No optic
Atmosphere:	Air
Evaluation	
Corrections:	Escape B
Stripping cycles:	9
Elements:	Ba Br Ca Ga Hf K I Pb Pd P Te Tm Y Zn Zr
Deconvolution method:	Bayes

A callout box with a black border and white background is overlaid on the spreadsheet, containing the text: "Next, click on the 'Points' Spreadsheet tab. This is why in Artax your folders must be named 'Points'". The callout box has a pointer pointing to the "Points" tab in the Excel window's tab bar at the bottom.

The Excel window's taskbar at the bottom shows the Windows Start button, several application icons (including Internet Explorer, File Explorer, and Artax), and the system tray with the date and time: 1:27 PM, 1/10/2014.

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

File Home Insert Page Layout Formulas Data Review View Developer Add-Ins

Clipboard Font Alignment Number Styles Cells Editing

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1					Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12	M
2				OB40Archibarca35@100114_093819	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485	
3				OB40Basaltic_Plateau20@100114_093819	2191	2874	24	6490	273	2011	3	1389	180679	259	0	179	122	
4				OB40Big_Southern_Butte06@100114_093819	1450	172	69	261	163	2029	1	1194	35256	549	171	86	1894	
5				OB40Blue_Mountain04@100114_093819	5830	699	272	99	127	1585	1	1175	83709	476	1	139	1412	
6				OB40Burns_Green15@100114_093819	2138	279	68	81	170	2103	0	1192	52218	223	77	107	1577	
7				OB40Cannonball1_22@100114_093819	1590	395	218	227	101	2194	47	1340	69313	508	2	141	1820	
8				OB40Casa_Diablo10@100114_093819	6278	549	25	586	202	2246	12	1228	26577	286	36	35	1880	
9				OB40Cerro_del_Medio28@100114_093819	3121	280	108	92	143	2724	1	1242	21207	365	0	122	1842	
10				OB40Chickahominy26@100114_093819	577	169	169	269	154	1699	17	1199	22794	256	0	53	1674	
11				OB40Cougar_Mountain29@100114_093819	6									312	72	100	1571	
12				OB40Davis_Creek27@100114_093819	4									297	1	100	1885	
13				OB40East_Medicine_lake12@100114_093819	4									299	-1	110	1725	
14				OB40El_Paraiso24@100114_093819	1									587	2	154	1704	
15				OB40El_Peceno40@100114_093819	6									369	4	63	1728	
16				OB40Glass_Butttes03@100114_093819	6									300	2	182	1583	
17				OB40Grasshopper_Flat13@100114_093819	4									292	37	176	1761	
18				OB40Gregory_Creek38@100114_093819	11									261	8	24	1764	
19				OB40Guadalupe_Victoria02@100114_093819	568	302	72	722	60	2397	21	1307	21978	315	2	93	1532	
20				OB40Inman_Creek14@100114_093819	5107	308	82	604	171	1623	1	1269	32541	331	8	147	1077	
21				OB40KES_276_18@100114_093819	2547	1192	197	484	179	2592	1	1364	65141	465	6	21	2103	
22				OB40KES_362_17@100114_093819	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883	

Parameter Points

Ready

100%

1:28 PM 1/10/2014

You will see a list of your data from the 'Points' folder in

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

File Home Insert Page Layout Formulas Data Review View Developer Add-Ins

Clipboard Font Alignment Number Styles Cells Editing

Calibri 11 A A B I U Merge & Center General \$ % .00 .00 Conditional Formatting as Table Styles Insert Delete Format AutoSum Fill Clear Sort & Filter Find & Select

A1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	M
					Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12	M
2				OB40Archibarca35@100114_093819	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485	
3				OB40Basaltic_Plateau20@100114_093819	2191	2874	24	6490	273	2011	3	1389	180679	259	0	179	122	
4				OB40Big_Southern_Butte06@100114_093819	1450	172	69	261	163	2029	1	1194	35256	549	171	86	1894	
5				OB40Blue_Mountain04@100114_093819	5830	690	272	99	127	1585	1	1175	82700	476	1	120	1412	
6				OB40Burns_Green15@100114_093819	2138													577
7				OB40Cannonball1_22@100114_093819	1590													820
8				OB40Casa_Diablo10@100114_093819	6278													880
9				OB40Cerro_del_Medio28@100114_093819	2121													842
10				OB40Chickahominy26@100114_093819	7348													674
11				OB40Cougar_Mountain29@100114_093819	6992													571
12				OB40Davis_Creek27@100114_093819	4296													885
13				OB40East_Medicine_lake12@100114_093819	4404													725
14				OB40El_Paraiso24@100114_093819	1674													704
15				OB40El_Peceno40@100114_093819	6543													728
16				OB40Glass_Butttes03@100114_093819	6634													583
17				OB40Grasshopper_Flat13@100114_093819	4884	660	120	683	174	2058	1	1311	27492	292	37	176	1761	
18				OB40Gregory_Creek38@100114_093819	11648	418	182	746	160	2382	1	1267	18732	261	8	24	1764	
19				OB40Guadalupe_Victoria02@100114_093819	5688	362	72	412	88	1937	11	1304	12993	315	2	93	1532	
20				OB40Inman_Creek14@100114_093819	5107	308	82	604	171	1623	1	1269	32541	331	8	147	1077	
21				OB40KES_276_18@100114_093819	2547	1192	197	484	179	2592	1	1364	65141	465	6	21	2103	
22				OB40KES_362_17@100114_093819	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883	

Parameter Points

Ready 100%

1:28 PM 1/10/2014

As columns, you will see the K, L, and sometimes M shell peak summaries of your spectra

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

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Clipboard Font Alignment Number Styles Cells Editing

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	M
1					Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12	M
2				OB40Archibarca35@100114_093819	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485	
3				OB40Basaltic_Plateau20@100114_093819	2191	2874	24	6490	273	2011	3	1389	180679	259	0	179	122	
4				OB40Big_Southern_Butte06@100114_093819	1450	172	69	261	163	2029	1	1194	35256	549	171	86	1894	
5				OB40Blue_Mountain04@100114_093819	5830	699	272	99	127	1585	1	1175	83709	476	1	139	1412	
6														223	77	107	1577	
7													313	508	2	141	1820	
8													26577	286	36	35	1880	
9													21207	365	0	122	1842	
10													33724	256	0	53	1674	
11													23675	312	72	100	1571	
12													15340	297	1	100	1885	
13													29760	299	-1	110	1725	
14													57390	587	2	154	1704	
15													18034	369	4	63	1728	
16													18446	300	2	182	1583	
17													27492	292	37	176	1761	
18													18732	261	8	24	1764	
19													12993	315	2	93	1532	
20													32541	331	8	147	1077	
21				OB40KES_276_18@100114_093819	2547	1192	197	484	179	2592	1	1364	65141	465	6	21	2103	
22				OB40KES_362_17@100114_093819	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883	

Parameter Points

Ready

100%

1:28 PM 1/10/2014

These numbers are the Net Count Rates for each element, in essence, the number of photons for each element after removing other elemental interference and background

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

File Home Insert Page Layout Formulas Data Review View Developer Add-Ins

Clipboard Font Alignment Number Styles Cells Editing

D2 OB40Archibarca35@100114_093819

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	M
1					Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12	M
2				OB40Archibarca35@100114_093819	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485	
3				OB40Basaltic_Plateau20@100114_093819	2191	2874	24	6490	273	2011	3	1389	180679	259	0	179	122	
4				OB40Big_Southern_Butte06@100114_093819	1450	172	69	261	163	2029	1	1194	35256	549	171	86	1894	
5				OB40Blue_Mountain04@100114_093819										476	1	139	1412	
6				OB40Burns_Green15@100114_093819										223	77	107	1577	
7				OB40Cannonball1_22@100114_093819										508	2	141	1820	
8				OB40Casa_Diablo10@100114_093819										286	36	35	1880	
9				OB40Cerro_del_Medio28@100114_093819										365	0	122	1842	
10				OB40Chickahominy26@100114_093819										256	0	53	1674	
11				OB40Cougar_Mountain29@100114_093819										312	72	100	1571	
12				OB40Davis_Creek27@100114_093819										297	1	100	1885	
13				OB40East_Medicine_lake12@100114_093819										299	-1	110	1725	
14				OB40El_Paraiso24@100114_093819	1674	304	165	-1	82	2876	1	1270	57390	587	2	154	1704	
15				OB40El_Peceno40@100114_093819	6543	323	30	787	106	2132	1	1241	18034	369	4	63	1728	
16				OB40Glass_Butttes03@100114_093819	6634	366	19	554	125	1783	1	1262	18446	300	2	182	1583	
17				OB40Grasshopper_Flat13@100114_093819	4884	660	120	683	174	2058	1	1311	27492	292	37	176	1761	
18				OB40Gregory_Creek38@100114_093819	11648	418	182	746	160	2382	1	1267	18732	261	8	24	1764	
19				OB40Guadalupe_Victoria02@100114_093819	5688	362	72	412	88	1937	11	1304	12993	315	2	93	1532	
20				OB40Inman_Creek14@100114_093819	5107	308	82	604	171	1623	1	1269	32541	331	8	147	1077	
21				OB40KES_276_18@100114_093819	2547	1192	197	484	179	2592	1	1364	65141	465	6	21	2103	
22				OB40KES_362_17@100114_093819	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883	

To clean up the data a little, select the @number_number text

Parameter Points

Edit 100%

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Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

File Home Insert Page Layout Formulas Data Review View Developer Add-Ins

Clipboard Font Alignment Number Styles Cells Editing

D2 OB40Archibarca35@100114_093819

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	M
1					Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12	M
2				<u>OB40Archibarca35@100114_093819</u>	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485	
3				OB40Basaltic_Plateau20@100114_093819	2191	2874	24	6490	273	2011	3	1389	180679	259	0	179	122	
4				OB40Big_Southern_Butte06@100114_093819	1450	172	69	261	163	2029	1	1194	35256	549	171	86	1894	
5				OB40Blue_Mountain04@100114_093819	5830	699	272	99	127	1585	1	1175	83709	476	1	139	1412	
6				OB40Burns_Green15@100114_093819									52218	223	77	107	1577	
7				OB40Cannonball1_22@100114_093819									69313	508	2	141	1820	
8				OB40Casa_Diablo10@100114_093819									26577	286	36	35	1880	
9				OB40Cerro_del_Medio28@100114_093819									21207	365	0	122	1842	
10				OB40Chickahominy26@100114_093819									33724	256	0	53	1674	
11				OB40Cougar_Mountain29@100114_093819									23675	312	72	100	1571	
12				OB40Davis_Creek27@100114_093819													100	1885
13				OB40East_Medicine_lake12@100114_093819													10	1725
14				OB40El_Paraiso24@100114_093819													54	1704
15				OB40El_Peceno40@100114_093819													63	1728
16				OB40Glass_Butttes03@100114_093819	6634	366	19										82	1583
17				OB40Grasshopper_Flat13@100114_093819	4884	660	120										76	1761
18				OB40Gregory_Creek38@100114_093819	11648	418	182										24	1764
19				OB40Guadalupe_Victoria02@100114_093819	5688	362	72										93	1532
20				OB40Inman_Creek14@100114_093819	5107	308	82										47	1077
21				OB40KES_276_18@100114_093819	2547	1192	197										21	2103
22				OB40KES_362_17@100114_093819	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883	

Find and Replace

Find what: @100114_093819

Replace with:

Replace All Replace Find

Paste the @number_number text

Parameter Points

Edit

100%

1:30 PM 1/10/2014

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

File Home Insert Page Layout Formulas Data Review View Developer Add-Ins

Clipboard Font Alignment Number Styles Cells Editing

D2 OB40Archibarca35@100114_093819

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1					Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12	M
2				<u>OB40Archibarca35@100114_093819</u>	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485	
3				OB40Basaltic_Plateau20@100114_093819	2191	2874	24	6490	273	2011	3	1389	180679	259	0	179	122	
4				OB40Big_Southern_Butte06@100114_093819	1450	172	69	261	163	2029	1	1194	35256	549	171	86	1894	
5				OB40Blue_Mountain04@100114_093819	5830	699	272	99	127	1585	1	1175	83709	476	1	139	1412	
6				OB40Burns_Green15@100114_093819									52218	223	77	107	1577	
7				OB40Cannonball1_22@100114_093819									69313	508	2	141	1820	
8				OB40Casa_Diablo10@100114_093819									26577	286	36	35	1880	
9				OB40Cerro_del_Medio28@100114_093819									21207	365	0	122	1842	
10				OB40Chickahominy26@100114_093819									33724	256	0	53	1674	
11				OB40Cougar_Mountain29@100114_093819									23675	312	72	100	1571	
12				OB40Davis_Creek27@100114_093819									15340	297	1	100	1885	
13				OB40East_Medicine_lake12@100114_093819									20760	299	-1	110	1725	
14				OB40El_Paraiso24@100114_093819											2	154	1704	
15				OB40El_Peceno40@100114_093819											4	63	1728	
16				OB40Glass_Butttes03@100114_093819	6634										2	182	1583	
17				OB40Grasshopper_Flat13@100114_093819	4884										37	176	1761	
18				OB40Gregory_Creek38@100114_093819	11648										8	24	1764	
19				OB40Guadalupe_Victoria02@100114_093819	5688	362	72	412	88	1937	11	1304	12993	315	2	93	1532	
20				OB40Inman_Creek14@100114_093819	5107	308	82	604	171	1623	1	1269	32541	331	8	147	1077	
21				OB40KES_276_18@100114_093819	2547	1192	197	484	179	2592	1	1364	65141	465	6	21	2103	
22				OB40KES_362_17@100114_093819	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883	

Find and Replace

Find what: @100114_093819

Replace with:

Replace All Replace

Options >>

And replace it with nothing

Parameter Points

Edit

100%

1:30 PM 1/10/2014

Bayesian Deconvolution

The image shows a Microsoft Excel spreadsheet titled "Artax Example Results.xlsx". The spreadsheet contains a table with columns for various elements and their concentrations. A search dialog box is open, indicating that 40 replacements were made. A callout bubble points to the text "OB40Basaltic_Plateau20" in the spreadsheet, with the text "This will simplify your file names".

Callout Text: This will simplify your file names

Search Dialog Box: Microsoft Excel
Excel has completed its search and has made 40 replacements.
Buttons: Replace All, Replace, Find All, End Next, Close

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
					Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12	M
1																		
2				OB40Archibarca35	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485	
3				<u>OB40Basaltic_Plateau20</u>	2191	2874	24	6490	273	2011	3	1389	180679	259	0	179	122	
4				OB40Big_Southern_Butte06	1450	172	69	261	163	2029	1	1194	35256	549	171	86	1894	
5				OB40Blue_Mountain04	5830	699	272	99	127	1585	1	1175	83709	476	1	139	1412	
6				OB40Burns_Green15									52218	223	77	107	1577	
7				OB40Cannonball1_22									69313	508	2	141	1820	
8				OB40Casa_Diablo10									26577	286	36	35	1880	
9				OB40Cerro_del_Medio28									21207	365	0	122	1842	
10				OB40Chickahominy26									33724	256	0	53	1674	
11				OB40Cougar_Mountain29									23675	312	72	100	1571	
12				OB40Davis_Creek27									15340	297	1	100	1885	
13				OB40East_Medicine_lake12									29760	299	-1	110	1725	
14				OB40El_Paraiso24									57390	587	2	154	1704	
15				OB40El_Peceno40									18034	369	4	63	1728	
16				OB40Glass_Butttes03	6634	366	19	554	125	1783	1	1262	18446	300	2	182	1583	
17				OB40Grasshopper_Flat13	4884	660	120	683	174	2058	1	1311	27492	292	37	176	1761	
18				OB40Gregory_Creek38	11648	418	182	746	160	2382	1	1267	18732	261	8	24	1764	
19				OB40Guadalupe_Victoria02	5688	362	72	412	88	1937	11	1304	12993	315	2	93	1532	
20				OB40Inman_Creek14	5107	308	82	604	171	1623	1	1269	32541	331	8	147	1077	
21				OB40KES_276_18	2547	1192	197	484	179	2592	1	1364	65141	465	6	21	2103	
22				OB40KES_362_17	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883	

Bayesian Deconvolution

The screenshot shows a Microsoft Excel spreadsheet titled "Artax Example Results.xlsx". The spreadsheet contains a table with 22 rows and 17 columns. The first column (D) is highlighted in yellow and contains data names. A callout box points to this column with the text: "Give a name to the column with your data names, this will help with plotting".

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1				Data Source	Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12
2				OB40Archibarca35	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485
3				OB40Basaltic_Plateau20	2484	2874	24	6488	272	2214	2	1288	188678	258	8	179	122
4				OB40Big_Southern_Butte06												86	1894
5				OB40Blue_Mountain04												139	1412
6				OB40Burns_Green15												107	1577
7				OB40Cannonball1_22												141	1820
8				OB40Casa_Diablo10												35	1880
9				OB40Cerro_del_Medio28												122	1842
10				OB40Chickahominy26												53	1674
11				OB40Cougar_Mountain29												100	1571
12				OB40Davis_Creek27	4296	220	1	589	128	2482	1	1390	15340	297	1	100	1885
13				OB40East_Medicine_lake12	4404	770	94	634	149	1890	0	1298	29760	299	-1	110	1725
14				OB40El_Paraiso24	1674	304	165	-1	82	2876	1	1270	57390	587	2	154	1704
15				OB40El_Peceno40	6543	323	30	787	106	2132	1	1241	18034	369	4	63	1728
16				OB40Glass_Butttes03	6634	366	19	554	125	1783	1	1262	18446	300	2	182	1583
17				OB40Grasshopper_Flat13	4884	660	120	683	174	2058	1	1311	27492	292	37	176	1761
18				OB40Gregory_Creek38	11648	418	182	746	160	2382	1	1267	18732	261	8	24	1764
19				OB40Guadalupe_Victoria02	5688	362	72	412	88	1937	11	1304	12993	315	2	93	1532
20				OB40Inman_Creek14	5107	308	82	604	171	1623	1	1269	32541	331	8	147	1077
21				OB40KES_276_18	2547	1192	197	484	179	2592	1	1364	65141	465	6	21	2103
22				OB40KES_362_17	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

File Home Insert Page Layout Formulas Data Review View Developer Add-Ins

Clipboard Font Alignment Number Styles Cells Editing

Calibri 11

General

Conditional Formatting as Table Styles

AutoSum Fill Clear Sort & Filter Find & Select

N1 Ga K12

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	M
1				Data Source	Ba K12	Ba L1	Br K12	Ca K12	Cr K12	Cs K12	Cs L1	Cu K12	Fe K12	Ga K12	Hf L1	Hf M1	K K12	M
2				OB40Archibarca35	5026	513	131	1033	237	2348	-1	1191	24558	333	123	124	1485	
3				OB40Basaltic_Plateau20	2191	2874	24	6490	273	2011	3	1389	180679	259	0	179	122	
4				OB40Big_Southern_Butte06	1450	172	69	261	163	2029	1	1194	35256	549	171	86	1894	
5				OB40Blue_Mountain04	5830	699	272	99	127	1585	1	1175	83709	476	1	139	1412	
6				OB40Burns_Green15	2138	279	68	81	170	2103	0	1192	52218	223	77	107	1577	
7				OB40Cannonball1_22	1590	395	218	227	101	2194	47	1340	69313	508	2	141	1820	
8				OB40Casa_Diablo10	6278	549	25	586	202	2246	12	1228	26577	286	36	35	1880	
9				OB40Cerro_del_Medio28	2121	280	108	92	143	2724	1	1242	21207	365	0	122	1842	
10				OB40Chickahominy26	7348	577	162	368	154	1602	17	1183	33724	256	0	53	1674	
11				OB40Cougar_Mountain39	6992	317	171	427	100	2507	1	1395	23675	312	72	100	1571	
12				OB40Davis_Creek27	4296	220	1	589	28	2482	1	1390	15340	297	1	100	1885	
13				OB40East_Medicine_lake1									29760	299	-1	110	1725	
14				OB40El_Paraiso24								1270	57390	587	2	154	1704	
15				OB40El_Peceno40								1241	18034	369	4	63	1728	
16				OB40Glass_Butttes03								1262	18446	300	2	182	1583	
17				OB40Grasshopper_Flat13								1311	27492	292	37	176	1761	
18				OB40Gregory_Creek38								1267	18732	261	8	24	1764	
19				OB40Guadalupe_Victoria0								1304	12993	315	2	93	1532	
20				OB40Inman_Creek14								1269	32541	331	8	147	1077	
21				OB40KES_276_18								1364	65141	465	6	21	2103	
22				OB40KES_362_17	1526	631	342	89	172	1635	16	1255	162561	486	258	137	1883	

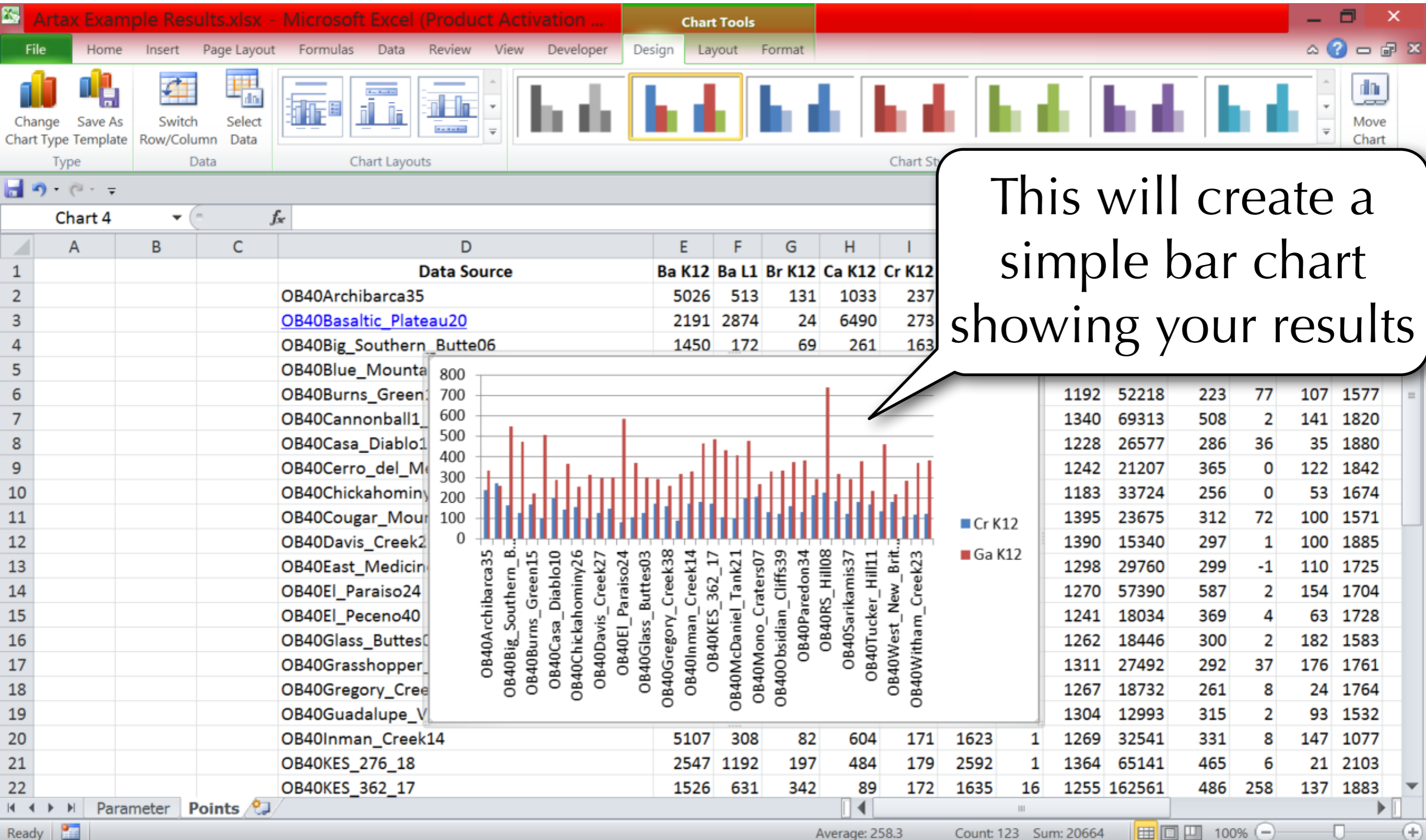
Parameter Points

Ready Average: 258.3 Count: 123 Sum: 20664 100%

1:38 PM 1/10/2014

Then, select the names and elements you want to compare

Bayesian Deconvolution



This will create a simple bar chart showing your results

Bayesian Deconvolution

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File Home Insert Page Layout Formulas Data Review View Developer Add-Ins

PivotTable Table Picture Clip Art Shapes SmartArt Screenshot Column Line Pie Bar Area Scatter Other Charts Line Column Win/Loss Slicer Hyperlink Text Box Header & Footer Object WordArt Signature Line Equation Symbol

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1	K K12	Mn K12	Nb K12	Ni K12	Pb L1	Pb M1	Pd K12	Pd L1	Rb K12	Rh K12	Rh L1	Sn K12	Sn L1	Sr K12	Sr L1	Te K12	Te L1	Th L1	Th M1	U L1	U M1	Y K12	Zn K12	Zr K12	
2	1485	1129	1628	101	503	126	54600	682	7365	5423	0	6041	0	24721	119	2206	0	549	2	0	0	1169	851	10189	
3	122	1841	361	515	96												1675	1	29	-2	8	14	793	1167	4340
4	1894	534	31448	65	1521										139	1926	0	804	0	186	0	19059	3635	29868	
5	1412	3006	1816	1	486										153	1811	15	297	30	1	0	5631	2122	34642	
6	1577	939	4709	58	865										15	1864	86	473	7	33	51	6977	1839	63315	
7	1820	847	10880	10	1053										0	2014	1	1387	0	0	0	8998	2796	104283	
8	1880	624	1080	20	739										119	2209	15	576	1	15	0	819	616	18235	
9	1842	740	5904	39	586										175	1999	1	704	0	174	0	3735	1017	15608	
10	1674	737	2100	10	1016										135	1676	0	427	0	-1	0	4509	992	29501	
11	1571	588	1360	87	409										224	2496	-1	354	0	2	0	4325	1136	12090	
12	1885	683	993	1	546	125	55572	791	7872	4671	1	5894	1	5233	0	2565	-1	572	0	0	0	993	665	8234	
13	1725	688	836	17	654	84	54951	553	9653	5729	65	5586	0	5912	171	2231	0	640	22	80	0	2022	634	19522	
14	1704	428	5537	1	717	167	50745											257	0	0	0	14820	3290	115478	
15	1728	1519	2406	53	841	150	55979								13	567	0	188	0	188	0	378	954	11461	
16	1583	638	774	22	386	109	55569								0	442	0	10	0	10	0	1923	644	8849	
17	1761	529	758	141	613	101	54335								1	653	0	32	0	32	0	2036	647	17232	
18	1764	1150	1121	31	525	43	55181								-1	217	0	31	0	31	0	1726	813	5142	
19	1532	966	1121	19	465	157	57969								0	467	33	40	0	40	0	907	719	6450	
20	1077	1086	707	98	364	116	55794								1	308	2	6	0	6	0	1186	896	8967	
21	2103	1913	26064	29	487	154	48128								0	1173	0	128	0	128	0	6403	1828	101268	
22	1883	3372	47011	1	1152	122	40656								1	2197	3	169	0	169	0	25929	6339	241913	

Parameter Points

Average: 394.925 Count: 82 Sum: 31594 100%

Ready

1:39 PM 1/10/2014

Here we have Thorium and Uranium

Uranium was only a small change in the spectra fitting

Bayesian Deconvolution

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PivotTable Table Picture Clip Art Shapes SmartArt Screenshot Column Line Pie Bar Area Scatter Other Charts Line Column Win/Loss Slicer Hyperlink Text Box Header & Footer Object WordArt Signature Line Equation Symbol

AH1 Th L1

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1	K K12	Mn K12	Nb K12	Ni K12	Pb L1	Pb M1	Pd K12	Pd L1	Rb K12	Rh K12	Rh L1	Sn K12	Sn L1	Sr K12	Sr L1	Te K12	Te L1	Th L1	Th M1	U L1	U M1	Y K12	Zn K12	Zr K12	
2	1485	1129	1628	101	503	126	54600	682	7365	5423	0	6041	0	24721	119	2206	0	549	2	0	0	1169	851	10189	
3	122	1841	361	515	96	107	41099	452	385	5122	90	4768	13	16084	76	1675	1	29	-2	8	14	793	1167	4340	
4	1894																	804	0	186	0	19059	3635	29868	
5	1412																	297	30	1	0	5631	2122	34642	
6	1577																	473	7	33	51	6977	1839	63315	
7	1820																	1387	0	0	0	8998	2796	104283	
8	1880																	576	1	15	0	819	616	18235	
9	1842																	704	0	174	0	3735	1017	15608	
10	1674																	427	0	-1	0	4509	992	29501	
11	1571																	354	0	2	0	4325	1136	12090	
12	1885																	572	0	0	0	993	665	8234	
13	1725																	640	32	80	0	2022	634	19522	
14	1704	428	5537	1	717	167	50745	619	14813	5178	0	6587	-1	18	140	1813	1	1197	0	0	0	14820	3290	115478	
15	1728	1519	2406	53	841	150	55979	574	15195	5639	0	5802	0	23946	67	2157	13	567	0	188	0	378	954	11461	
16	1583	638	774	22	386	109	55569	766	6751	5739	0	5795	1	5497	45	2046	0	442	0	10	0	1923	644	8849	
17	1761	529	758	141	613	101	54335	690	9336	5668	65	6285	0	5550	117	2008	1	653	0	32	0	2036	647	17232	
18	1764	1150	1121	31	525	43	55181	705	5006	5022	1	6022	0	11904	107	1883	-1	217	0	31	0	1726	813	5142	
19	1532	966	1121	19	465	157	57969	836	6856	5743	1	6230	1	5380	205	2434	0	467	33	40	0	907	719	6450	
20	1077	1086	707	98	364	116	55794	548	5649	4921	4	6200	0	12138	104	1984	1	308	2	6	0	1186	896	8967	
21	2103	1913	26064	29	487	154	48128	555	13211	5030	0	6008	1	3799	76	1785	0	1173	0	128	0	6403	1828	101268	
22	1883	3372	47011	1	1152	122	40656	523	24060	4534	13	5218	0	238	139	1248	1	2197	3	169	0	25929	6339	241913	

Parameter Points

Ready Average: 394.925 Count: 82 Sum: 31594 100%

1:39 PM 1/10/2014

However, these two elements are related, more Uranium should result in more Thorium

Bayesian Deconvolution

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PivotTable Table Picture Clip Art Shapes SmartArt Screenshot Column Line Pie Bar Area Scatter Other Charts Line Column Win/Loss Slicer Hyperlink Text Box Header & Footer WordArt Signature Line Object Equation Symbol Symbols

Scatter

Insert a Scatter chart, also known as an XY chart.

This type of chart compares pairs of values.

Use it when the values being charted are not in X-axis order or when they represent separate measurements.

We can test this by going to 'Insert' then 'Scatterplot'

Q	R	S	T	U	V	W	AB	AM	AN	AO
K K12	Mn K12	Nb K12	Ni K12	Pb L1	Pb M1	Pd K12	Sn K12	Zn K12	Zr K12	
1485	1129	1628	101	503	126	5460	6041	851	10189	
122	1841	361	515	96	107	4109	4768	1167	4340	
1894	534	31448	65	1521	115	5331	7414	3635	29868	
1412	3006	1816	1	486	167	5025	5330	2122	34642	
1577	939	4709	58	865	178	5274	5502	1839	63315	
1820	847	10880	10	1053	37	4854	5394	0	0	8998
1880	624	1080	20	739	194	54139	5966	0	15	0
1842	740	5904	39	586	176	55767	6572	1	174	0
1674	737	2100	10	1016	102	53810	5847	0	-1	0
1571	588	1360	87	409	101	55231	5893	0	2	0
1885	683	993	1	546	125	55572	5894	1	0	0
1725	688	836	17	654	84	54951	5586	0	80	0
1704	428	5537	1	717	167	50745	6587	-1	0	0
1728	1519	2406	53	841	150	55979	5802	0	188	0
1583	638	774	22	386	109	55569	5795	1	10	0
1761	529	758	141	613	101	54335	6285	0	32	0
1764	1150	1121	31	525	43	55181	6022	0	31	0
1532	966	1121	19	465	157	57969	6230	1	40	0
1077	1086	707	98	364	116	55794	6200	0	6	0
2103	1913	26064	29	487	154	48128	6008	1	128	0
1883	3372	47011	1	1152	122	40656	5218	0	169	0

Parameter Points

Average: 394.925 Count: 82 Sum: 31594

1:40 PM 1/10/2014

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation ...)

File Home Insert Page Layout Formulas Data Review View Developer Design Layout Format

Change Chart Type Save As Chart Template Switch Row/Column Data Select Data

Chart 5

Q R S T U V W X Y Z

	Q	R	S	T	U	V	W	X	Y	Z
1	K K12	Mn K12	Nb K12	Ni K12	Pb L1	Pb M1	Pd K12	Pd L1	Rb K12	Rh K12
2	1485	1129	1628	101	503	126	54600	682	7365	5423
3	122	1841	361	515	96	107	41099	452	385	5122
4	1894	534	31448	65	1521	115	53313	730	19232	5020
5	1412	3006	1816	1	486	167	5025	90	476	13
6	1577	939	4709	58	865	178	5274	13	16084	76
7	1820	847	10880	10	1053	37	4854	65	139	1926
8	1880	624	1080	20	739	194	5413	0	804	0
9	1842	740	5904	39	586	176	5576	30	186	0
10	1674	737	2100	10	1016	102	5381	7	33	51
11	1571	588	1360	87	409	101	5523	0	0	0
12	1885	683	993	1	546	125	5557	1	15	0
13	1725	688	836	17	654	84	5495	0	174	0
14	1704	428	5537	1	717	167	5074	0	0	0
15	1728	1519	2406	53	841	150	5597	0	819	616
16	1583	638	774	22	386	109	5556	0	3735	1017
17	1761	529	758	141	613	101	5433	0	4509	992
18	1764	1150	1121	31	525	43	5518	0	4325	1136
19	1532	966	1121	19	465	157	5796	0	993	665
20	1077	1086	707	98	364	116	55794	32	0	993
21	2103	1913	26064	29	487	154	48128	0	0	2022
22	1883	3372	47011	1	1152	122	40656	0	0	634

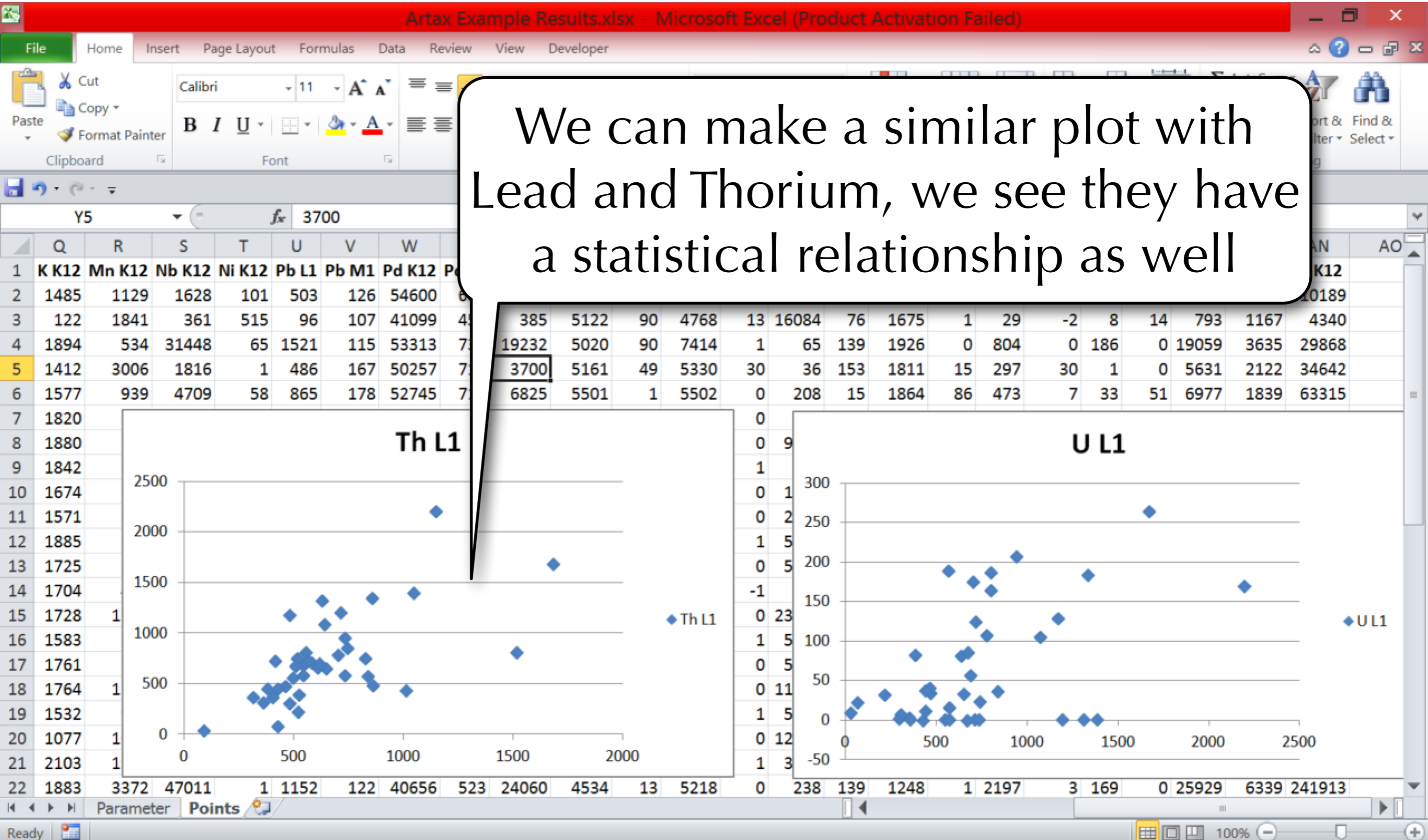
U L1

Average: 394.925 Count: 82 Sum: 31594

1:40 PM 1/10/2014

This will create a scatterplot with Thorium on the X-axis and Uranium on the Y-axis

Bayesian Deconvolution



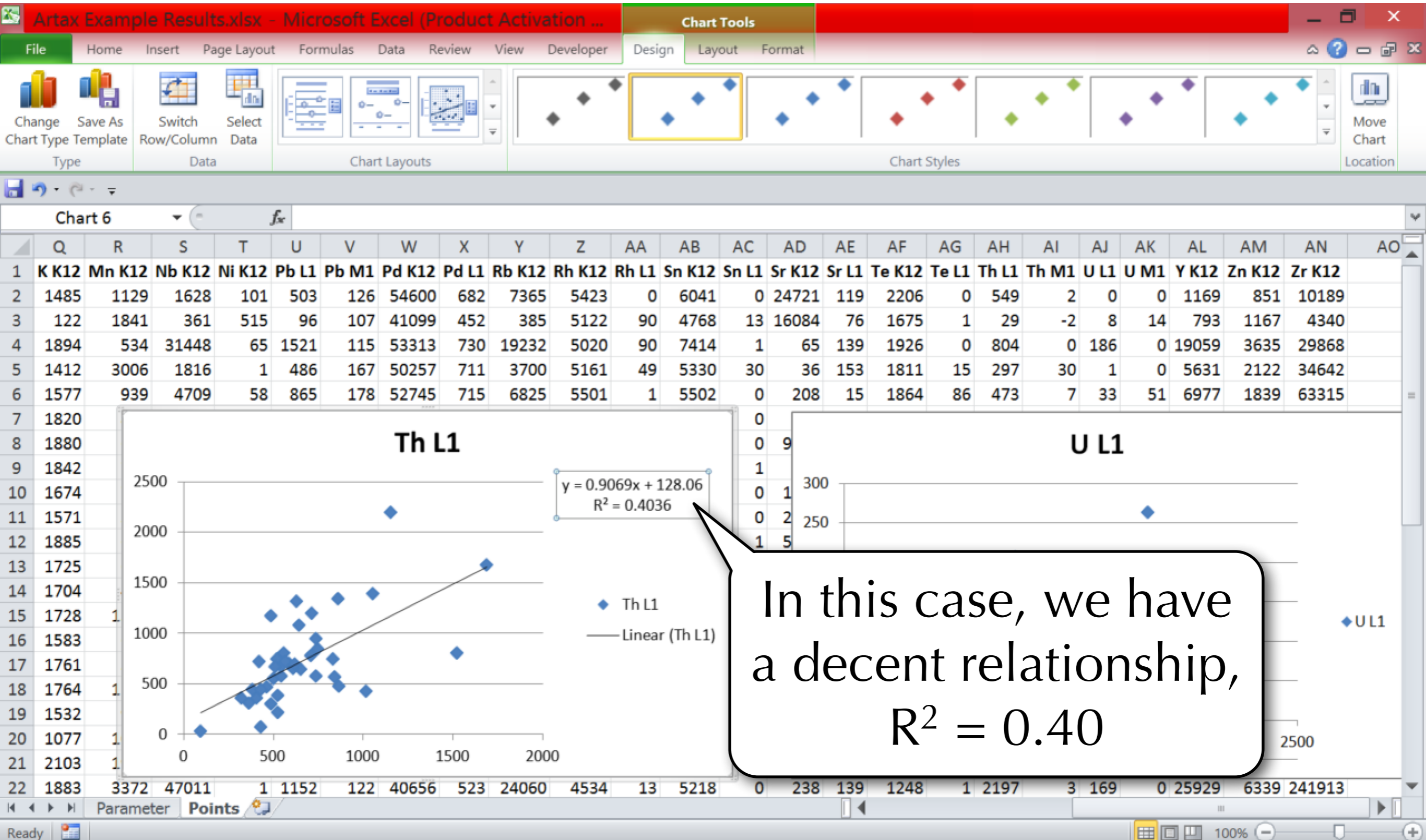
We can make a similar plot with Lead and Thorium, we see they have a statistical relationship as well

Bayesian Deconvolution

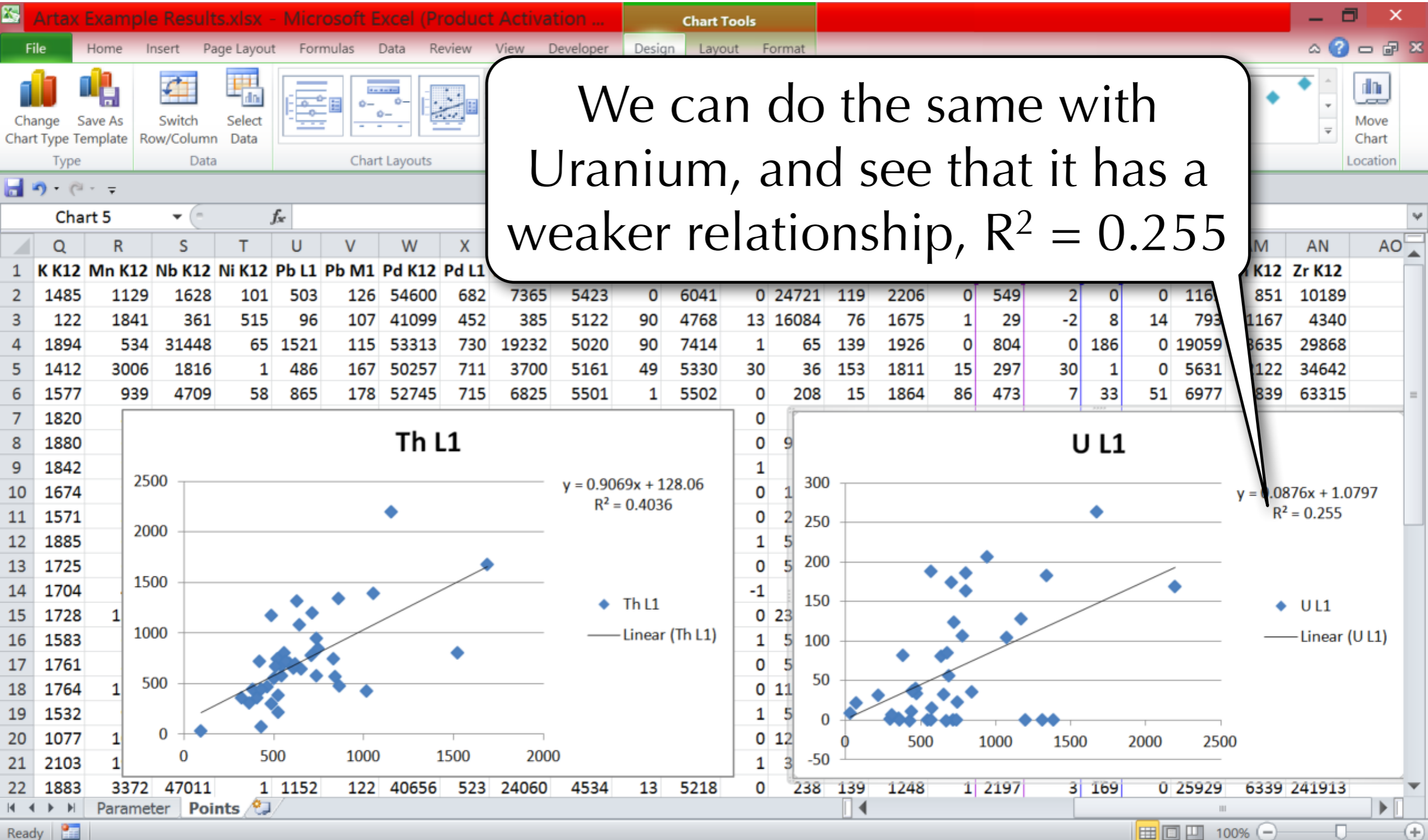
The screenshot shows the Microsoft Excel interface with a scatter plot titled 'Chart 6'. The plot displays data points for 'Th L1' and 'U L1'. A context menu is open over the 'Th L1' series, with 'Add Trendline...' highlighted. A callout box contains the text: 'To see the strength of the relationship, right click on the points and select 'Add Trendline''. The Excel formula bar shows the formula: $=SERIES(Points!\$AH\$1,Points!\$U\$2:\$U\$41,Points!\$AH\$2:\$AH\$41,1)$. The spreadsheet data is as follows:

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1	K K12	Mn K12	Nb K12	Ni K12	Pb L1	Pb M1	Pd K12	Pd L1	Rb K12	Rh K12	Rh L1	Sn K12	Sn L1	Sr K12	Sr L1	Te K12	Te L1	Th L1	Th M1	U L1	U M1	Y K12	Zn K12	Zr K12	
2	1485	1129	1628	101	503	126	54600	682	7365	5423	0	6041	0	24721	119	2206	0	549	2	0	0	1169	851	10189	
3	122	1841	361	515	96	107	41099	452	385	5122	90	4768	13	16084	76	1675	1	29	-2	8	14	793	1167	4340	
4	1894	534	31448	65	1521	115	53313	730	19232	5020	90	7414	1	65	139	1926	0	804	0	186	0	19059	3635	29868	
5	1412	3006	1816	1	486	167	50257	711	3700	5161	49	5330	30	36	153	1811	15	297	30	1	0	5631	2122	34642	
6	1577	939	4709	58	865	178	52745	715	6825	5501	1	5502	0	208	15	1864	86	473	7	33	51	6977	1839	63315	
7	1820																								
8	1880																								
9	1842																								
10	1674																								
11	1571																								
12	1885																								
13	1725																								
14	1704																								
15	1728																								
16	1583																								
17	1761																								
18																									
19																									
20																									
21	2103	1			500			1000		1500		2000		2500											
22	1883	3372	47011	1	1152	122	40656	523	24060	4534	13	5218	0	238	139	1248	1	2197	3	169	0	25929	6339	241913	

Bayesian Deconvolution



Bayesian Deconvolution



Bayesian Deconvolution

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Clipboard Font Alignment Number Styles Cells Editing

	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT
1	Pd L1	Rb K12	Rh K12	Rh L1	Sn K12	Sn L1	Sr K12	Sr L1	Te K12	Te L1	Th L1	Th M1	U L1	U M1	Y K12	Zn K12	Zr K12	Pb/Rh	Th/Rh	U/Rh			
2	682	7365	5423	0	6041	0	24721	119	2206	0	549	2	0	0	1169	851	10189						
3	452	385	5122	90	4768	13	16084	76	1675	1	29	-2	8	14	793	1167	4340						
4	730	19232	5020	90	7414	1	65	139	1926	0	804	0	186	0	19059	3635	298						
5	711	3700	5161	49	5330	30	36	153	1811	15	297	30	1	0	5631	2122	842						
6	715	6825	5501	1													63315						
7																	104283						
8																	18235						
9																	15608						
10																	29501						
11																	12090						
12																	8234						
13																	19522						
14																	115478						
15																	11461						
16																	8849						
17																	17232						
18																	5142						
19																	6450						
20																	8967						
21																	101268						
22																	241913						

$y = 0.9069x + 1$
 $R^2 = 0.4036$

Th L1
Linear (Th L1)

$y = 0.0876x + 1.0797$
 $R^2 = 0.255$

U L1
Linear (U L1)

We can also treat the data by normalizing to Rhodium, our X-ray target

Parameter Points

Ready

100%

1:44 PM 1/10/2014

Bayesian Deconvolution

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Cut Copy Paste Format Painter Clipboard

Font: 11, Bold, Italic, Underline, Text Color, Background Color, Merge & Center

Alignment: Wrap Text, Merge & Center

Number: General, Currency, Percentage, Increase/Decrease

Styles: Conditional Formatting, Format as Table, Cell Styles

Cells: Insert, Delete, Format

Editing: AutoSum, Fill, Clear, Sort & Filter, Find & Select

SUM $=U2/Z2$

	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
1	Pb L1	Pb M1	Pd K12	Pd L1	Rb K12	Rh K12	Rh L1	Sn K12	Sn L1	Sr K12	Sr L1	Te K12	Te L1	Th L1	Th M1	U L1	U M1	Y K12	Zn K12	Zr K12	Pb/Rh	Th/Rh	U/Rh	
2	503	126	54600	682	7365	5423	0	6041	0	24721	119	2206	0	549	2	0	0	1169	851	10189	$=U2/Z2$			
3	96	107	41099	452	385	5122	90	4768	13	16084	76	1675	1	29	-2	8	14	793	1167	4340				
4	1521	115	53313	730	19232	5020	90	7414	1	65	139	1926	0	804	0	186	0	19059	3635	29868				
5	486	167	50257	711	3700	5122	49	5330	30	208	15	1811	15	297	30	1	0	5631	2122	34642				
6	865	178	52745	715	6825	5501	1	5501	0	208	15	1811	86	473	7	33	51	6977	1839	63315				
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22	1152	122	406	100																				

Th L1
 $y = 0.9069x + 128.06$
 $R^2 = 0.4036$

U L1
 $y = 0.0876x + 1.0797$
 $R^2 = 0.255$

Parameter Points

Point

100% 1:45 PM 1/10/2014

Divide the Net Counts for an element by the Net Counts for Rhodium

Bayesian Deconvolution

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File Home Insert Page Layout Formulas Data Review View Developer Add-Ins

Cut Copy Paste Format Painter Clipboard

Font: 11, Bold, Italic, Underline, Text Color, Background Color, Merge & Center

Alignment: Wrap Text, Merge & Center

Number: General, Currency, Percentage, Increase/Decrease

Styles: Conditional Formatting, Format as Table, Cell Styles

Cells: Insert, Delete, Format

Editing: AutoSum, Fill, Clear, Sort & Filter, Find & Select

SUM $=AJ2/Z2$

	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AF
1	Pb L1	Pb M1	Pd K12	Pd L1	Rb K12	Rh K12	Rh L1	Sn K12	Sn L1	Sr K12	Sr L1	Te K12	Te L1	Th L1	Th M1	U L1	U M1	Y K12	Zn K12	Zr K12	Pb/Rh	Th/Rh	U/Rh	
2	503	126	54600	682	7365	5423	0	6041	0	24721	119	2206	0	549	2	0	0	1169	851	10189	0.092753	0.101235	$=AJ2/Z2$	
3	96	107	41099	452	385	5122	90	4768	13	16084	76	1675	1	29	-2	8	14	793	1167	4340				
4	1521	115	53313	730	19232	5020	90	7414		65	139	1926	0	804	0	15	0	19059	3635	29868				
5	486	167	50257	711	3700	5161	49	5330	30	36		1911	15	297	30		0	5631	2122	34642				
6	865	178	52745	715	6825	5501	1	5502	0	208	15	180												
7									0	1	0	2014	1											
8									0	9227	119	2209	15											
9									1	289	175	1999	1											
10									0	1845	135	1676	0											
11									0	2886	224	2496	-1											
12									1	5233	0	2565	-1											
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22	1152	122	406	100																				

Th L1

$y = 0.9069x + 128.06$
 $R^2 = 0.4036$

U L1

$y = 0.0876x + 1.0797$
 $R^2 = 0.255$

1

Do the same for all elements you wish to normalize

Parameter Points

Point

100%

1:46 PM 1/10/2014

Bayesian Deconvolution

Artax Example Results.xlsx - Microsoft Excel (Product Activation Failed)

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	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	
1	Pb L1	Pb M1	Pd K12	Pd L1	Rb K12	Rh K12	Rh L1	Sn K12	Sn L1	Sr K12	Sr L1	Te K12	Te L1	Th L1	Th M1	U L1	U M1	Y K12	Zn K12	Zr K12	Pb/Rh	Th/Rh	U/Rh		
2	503	126	54600	682	7365	5423	0	6041	0	24721	119	2206	0	549	2	0	0	1169	851	10189	0.092753	0.101235	0		
3	96	107	44													8	14	793	1167	4340	0.018743	0.005662	0.001562		
4	1521	115														186	0	19059	3635	29868	0.302988	0.160159	0.037052		
5	486	167														1	0	5631	2122	34642	0.094168	0.057547	0.000194		
6	865	178														33	51	6977	1839	63315	0.157244	0.085984	0.005999		
7																0	0	8998	2796	104283	0.215734	0.284163	0		
8																					0.138234	0.107744	0.002806		
9																174	0	3735	1017	15608	0.111006	0.133359	0.032961		
10																-1	0	4509	992	29501	0.191626	0.080536	-0.00019		
11																2	0	4325	1136	12090	0.080464	0.069644	0.000393		
12																0	0	0	993	665	8234	0.116891	0.122458	0	
13																32	80	0	2022	634	19522	0.114156	0.111712	0.013964	
14																0	0	0	14820	3290	115478	0.13847	0.23117	0	
15																0	188	0	378	954	11461	0.14914	0.10055	0.033339	
16																0	10	0	1923	644	8849	0.067259	0.077017	0.001742	
17																0	32	0	2036	647	17232	0.108151	0.115208	0.005646	
18																0	31	0	1726	813	5142	0.10454	0.04321	0.006173	
19																33	40	0	907	719	6450	0.080968	0.081316	0.006965	
20																2	6	0	1186	896	8967	0.073969	0.062589	0.001219	
21																0	128	0	6403	1828	101268	0.096819	0.233201	0.025447	
22	1152	122	406	100											3	169	0	25929	6339	241913	0.25408	0.484561	0.037274		

You can copy and paste the cells to quickly run calculations for all your data

Th L1
Linear (Th L1)

U L1
Linear (U L1)

$y = 0.0876x + 1.0797$
 $R^2 = 0.255$

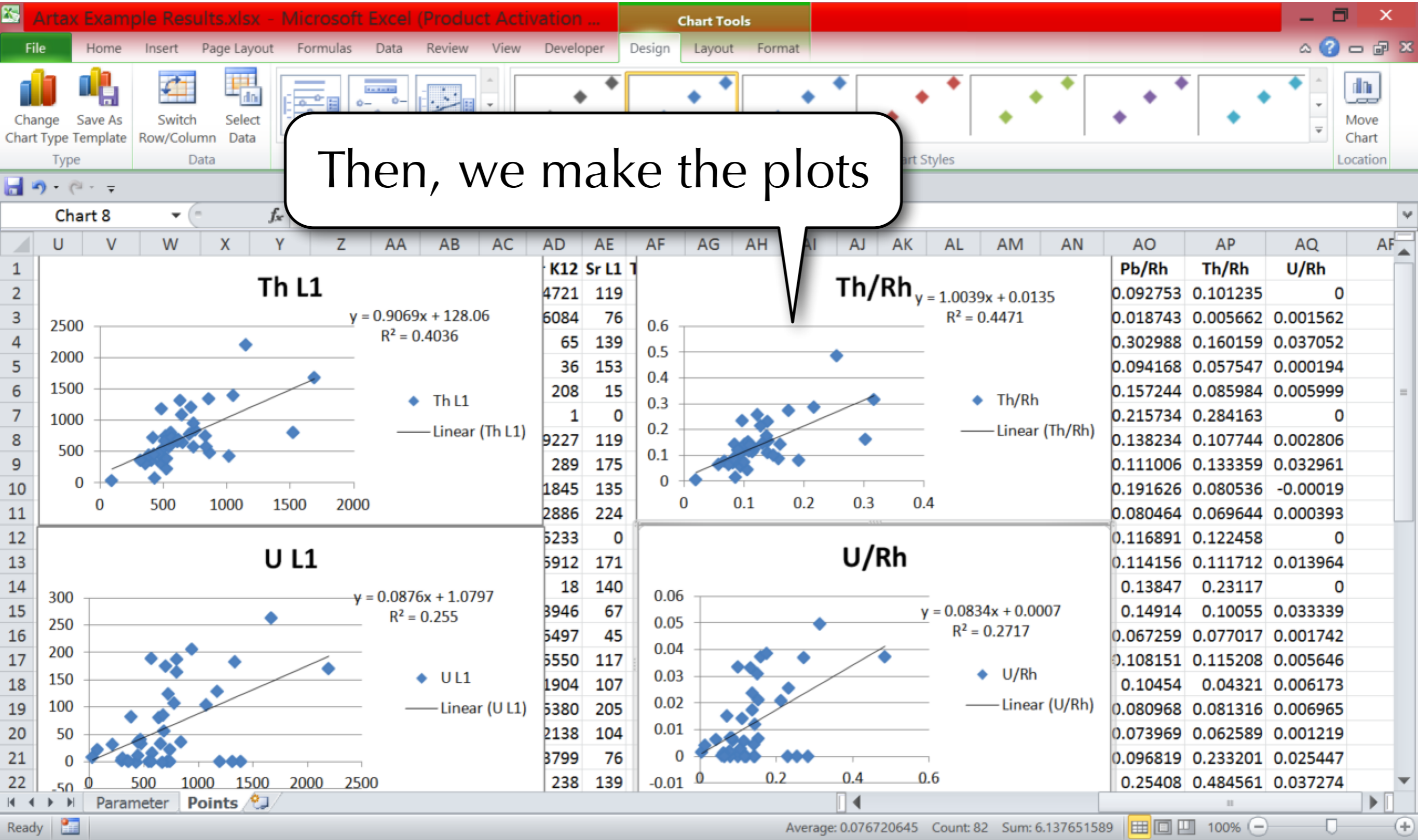
Parameter Points

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Bayesian Deconvolution

Then, we make the plots



Bayesian Deconvolution

You can see R2 values are better for normalized data

