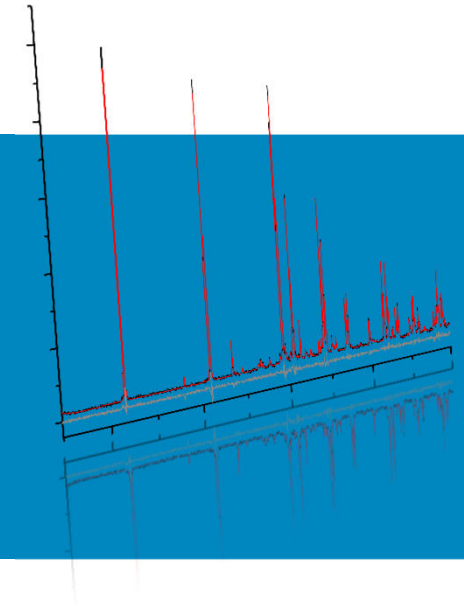


Lesson 6

BGMN & Profex



Nicola Döbelin
RMS Foundation, Bettlach, Switzerland

Rietveld Refinement Software BGMN

BGMN:

- Fundamental Parameters Approach
- Free for academic use
- Device independent
- Very robust automatic refinement strategy
- Slightly less steep learning curve
- Powerful scripting language
- Multi-Platform
- Multi-threaded

Visit: <http://www.bgmn.de> for tutorials and documentation

Program Description

Site map

Up Program Description BGMN FAQ Download Page

[Instrumental Function](#)

The following pages serve as a short introduction into the BGMN Rietveld software. A description of an example (plaster) makes your test runs easier.

[Tube Tails and size/strain estimation](#)

First, the generation of the instrumental function is described.

[Structure Description](#)

Second, the construction of structure files is explained. In an extra topic the handling of preferred orientation is mentioned in detail.

[Download Structures](#)

Third, the calculation control during a problem specific control file is shown.

[Preferred Orientation](#)

Last, we have a look at the different result files.

[Calculation Control](#)

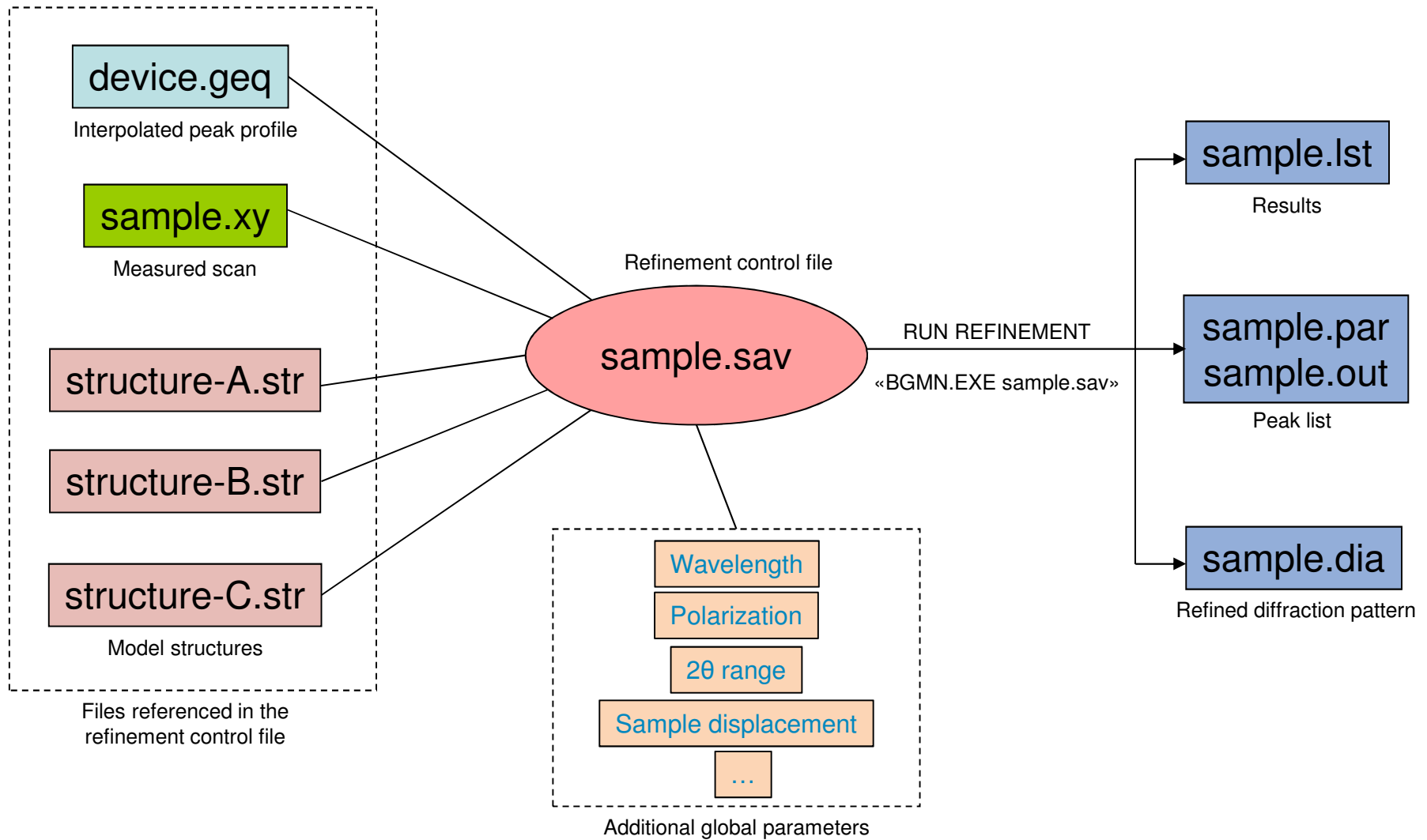
A somewhat extended explanation of the used variables is also available.

[Result Output](#)

[BGMN Variables](#)

<http://www.bgmn.de/program.html>

BGMN Control File (*.sav)



Graphical User Interface (GUI) for BGMN

Developer: Nicola Döbelin (private)

License: GPL (open source)

Platforms: Windows XP / Vista / 7 / 8
Linux
Mac OS X 10.6.8-10.9.2 (64bit)

Rietveld Backends: BGMN, Fullprof.2k

Website: <http://profex.doebelin.org>

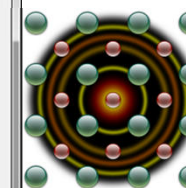
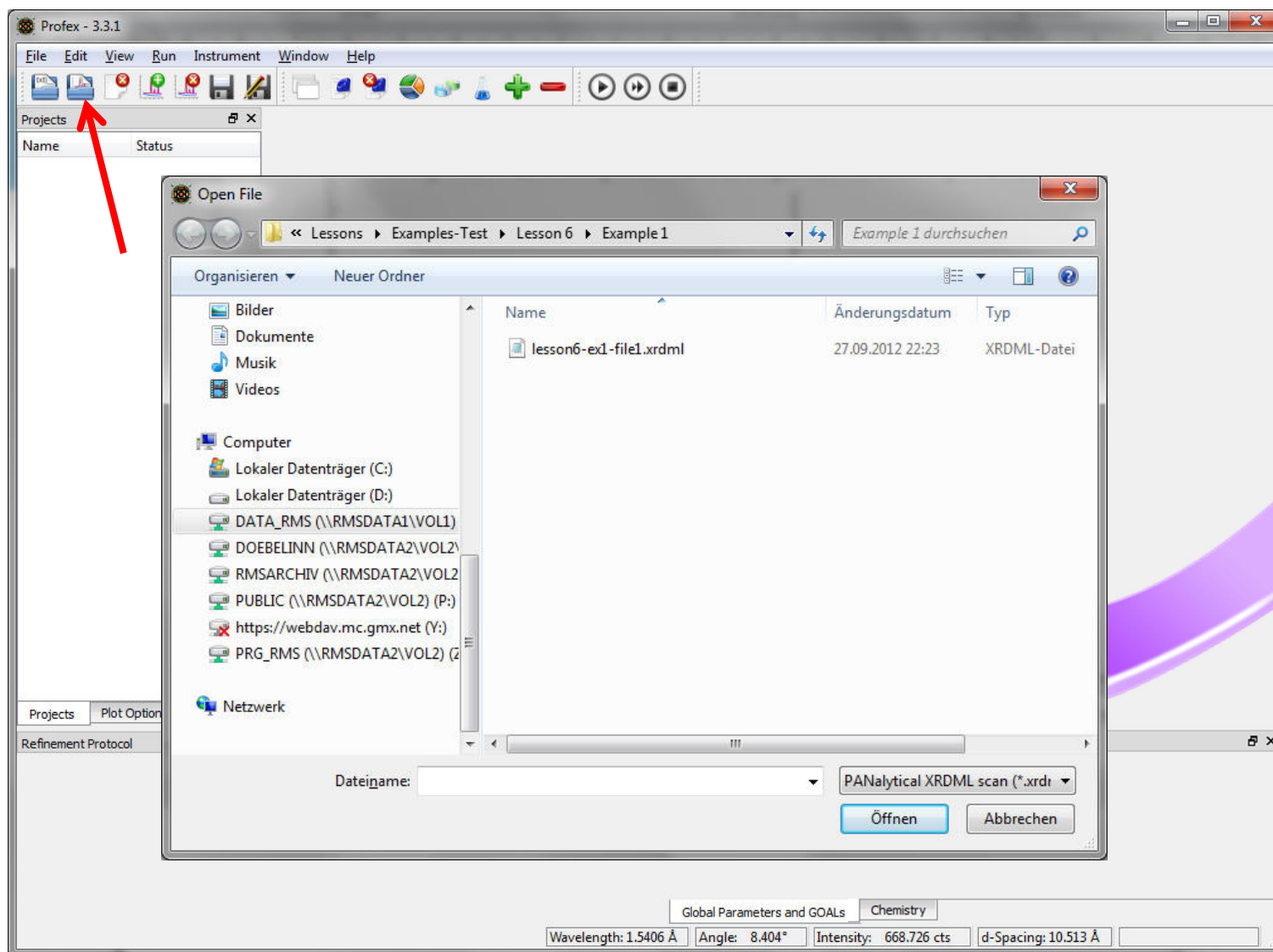
Current stable version: 3.3.1

History

- 2003: Start of development as an alternative GUI for Fullprof.2k
For personal use only (my PhD)
Linux only
- 2006: Major rewrite
Support for Windows
- 2012: Support for BGMN Rietveld backend added
- 2014: Support for Mac OS X

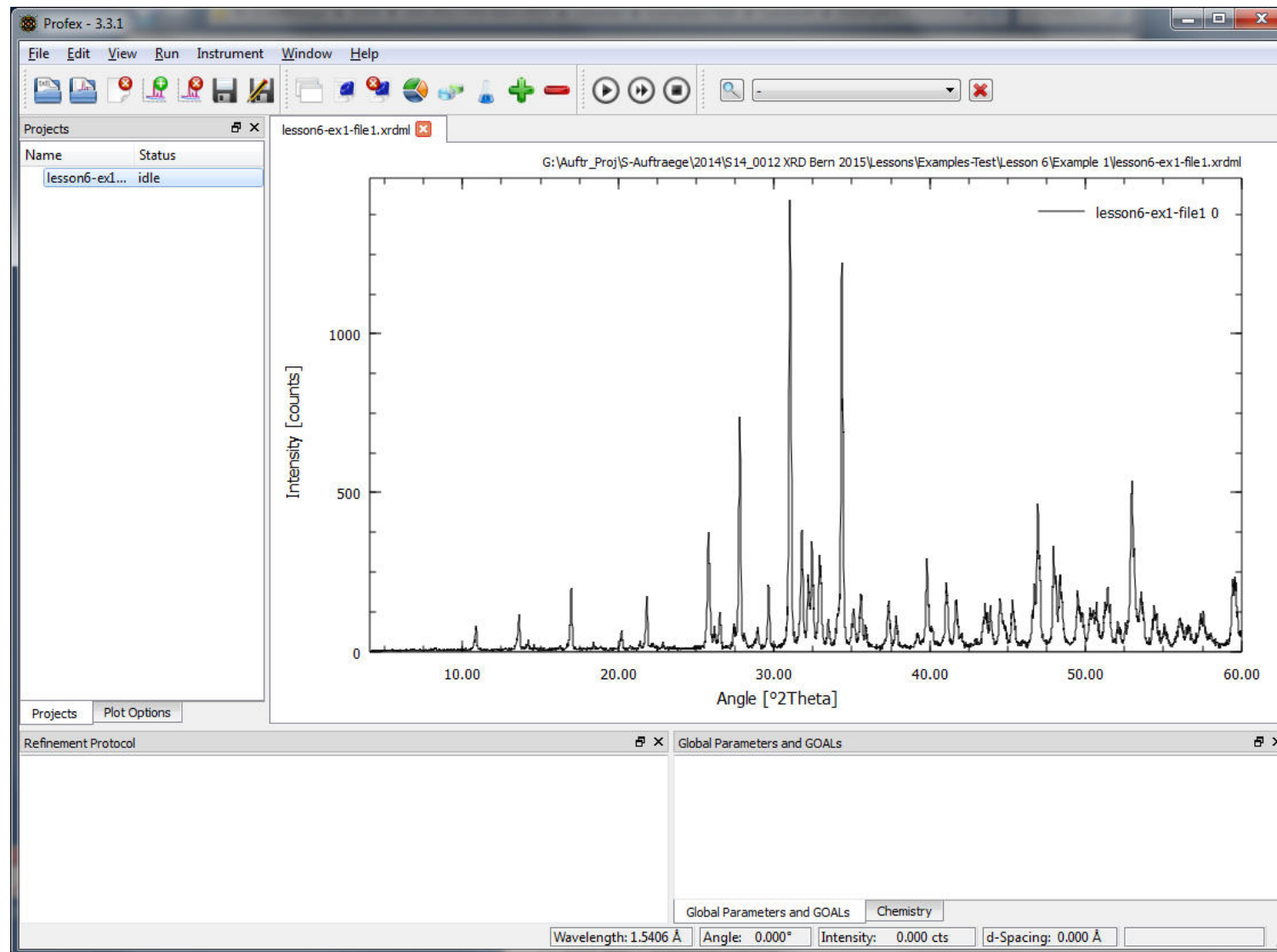


First Use



Profex

Lesson 6: Example 1



Lesson 6: Example 1

The screenshot shows the Profex 3.3.1 interface. The 'Append Phase' dialog box is open, displaying a list of structures. A red arrow points to the '+' icon in the toolbar. A red box highlights the file name 'Cubix-ads-10mm.geq'. Another red box highlights the text 'Select: betaTCP.str Hydroxylapatite.str' in the structures list.

File Name	Phase	Comr
<input type="checkbox"/> Ardealite.str	Ardealite	04-011
<input type="checkbox"/> benzoic-acid.str	Benzoic-Acid	CSD B
<input type="checkbox"/> beta_Ft.str	beta_Ft	
<input type="checkbox"/> betaCMP.str	betaCaMetaphosphate	01-075
<input type="checkbox"/> betaCPP.str	betaCaPyrophosphate	04-005
<input type="checkbox"/> betaCPP-tetrahydrate.str	betaCPP-tetrahydrate	04-011
<input checked="" type="checkbox"/> betaTCP.str	betaTCP	
<input type="checkbox"/> betaTCP-Mg.str	betaTCP-Mg	
<input type="checkbox"/> Brushite.str	Dicalciumphosphate_Dihydrat	
<input type="checkbox"/> C2S-Calcio-Olivine.str	C2S_orthorhombic	
<input type="checkbox"/> C2Sh-Hillebrandite.str	C2SH-Hillebrandite	
<input type="checkbox"/> C2S-Larnite.STR	C2S-monoclinic	
<input type="checkbox"/> C3S-Hatrurite.str	C3S_monoclinic	
<input type="checkbox"/> C3S-p-1.str	C3S_triclinic	
<input type="checkbox"/> C3S-r3m.str	C3S_rhombohedral	04-011
<input type="checkbox"/> CaCl2.str	CaCl2	04-007
<input type="checkbox"/> Ca-hydrogen-sulfate.str	Ca-hydrogen-sulfate	04-006

Lesson 6: Example 1

The screenshot displays the Profex 3.3.1 software interface. The main window contains a text editor with a BGMN control file. The file content is as follows:

```
% Theoretical instrumental function
VERZERR=cubix-ads-10mm.geq
% Wavelength
LAMBDA=CU
% Polarization (CuKa with Graphite monochromator)
POL=sqr(cos(26.6*pi/180))
pi=2*acos(0)
% Phases
STRUC[1]=betaTCP.str
STRUC[2]=Hydroxylapatite.str
% Measured data
VAL[1]=lesson6-ex1-file1.xy
% Minimum Angle (2theta)
% WMIN=10
% Maximum Angle (2theta)
% WMAX=60
% Result list output
LIST=lesson6-ex1-file1.lst
% Peak list output
OUTPUT=lesson6-ex1-file1.par
% Diagram output
DIAGRAMM=lesson6-ex1-file1.dia
% Global parameters for zero point and sample displacement
EPS1=0
PARAM[1]=EPS2=0_-0.01^0.01
alpha3ratio=0.02
betaratio=0
NTHREADS=8
PROTOKOLL=Y

sum=betaTCP+Hap
GOAL[1]=betaTCP/sum
GOAL[2]=Hap/sum
```

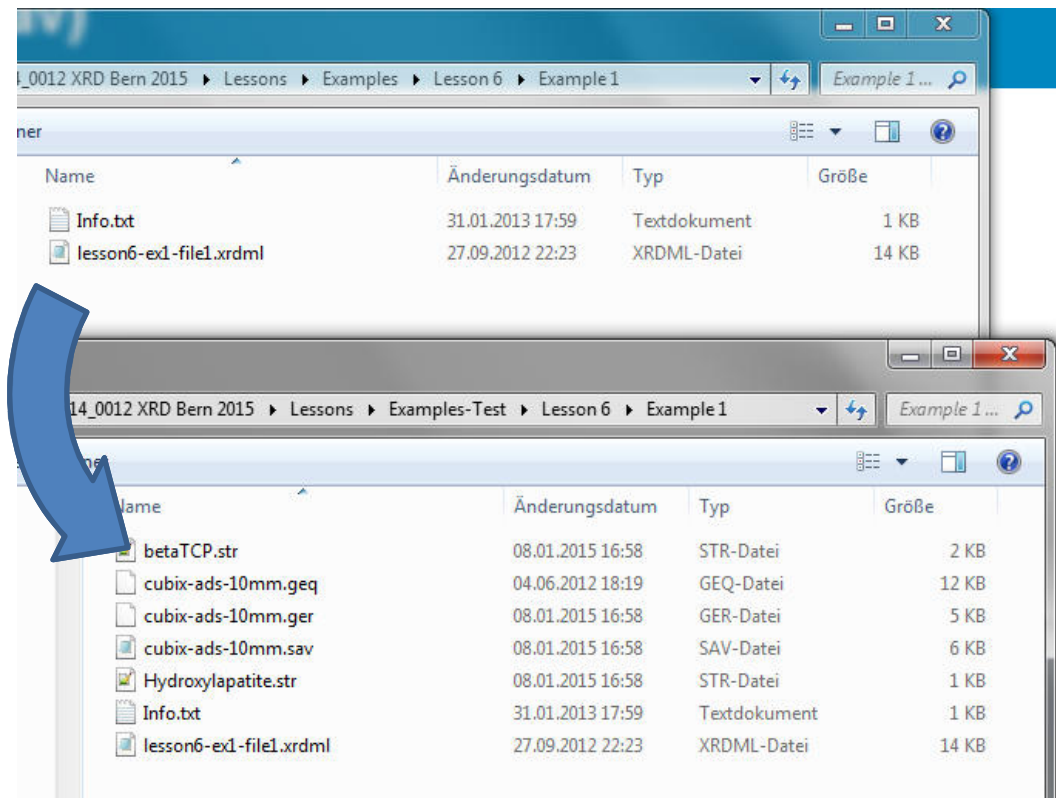
A red box with white text is overlaid on the right side of the window, stating: "BGMN control file was created".

At the bottom of the window, the "Refinement Protocol" section is visible, showing "Global Parameters and GOALS" with a "Chemistry" tab selected. The status bar at the very bottom displays: "Wavelength: 1.5406 Å | Angle: 0.000° | Intensity: 0.000 cts | d-Spacing: 0.000 Å | Line 0, Column 0".

BGMN Control File (*.sav)

What Profex does in the background:

- Generate a control file
- Adjust file names in control file
- Copy all selected **structure files** from local DB to location of scan file
- Copy **instrument configuration files** from local DB to location of the scan file



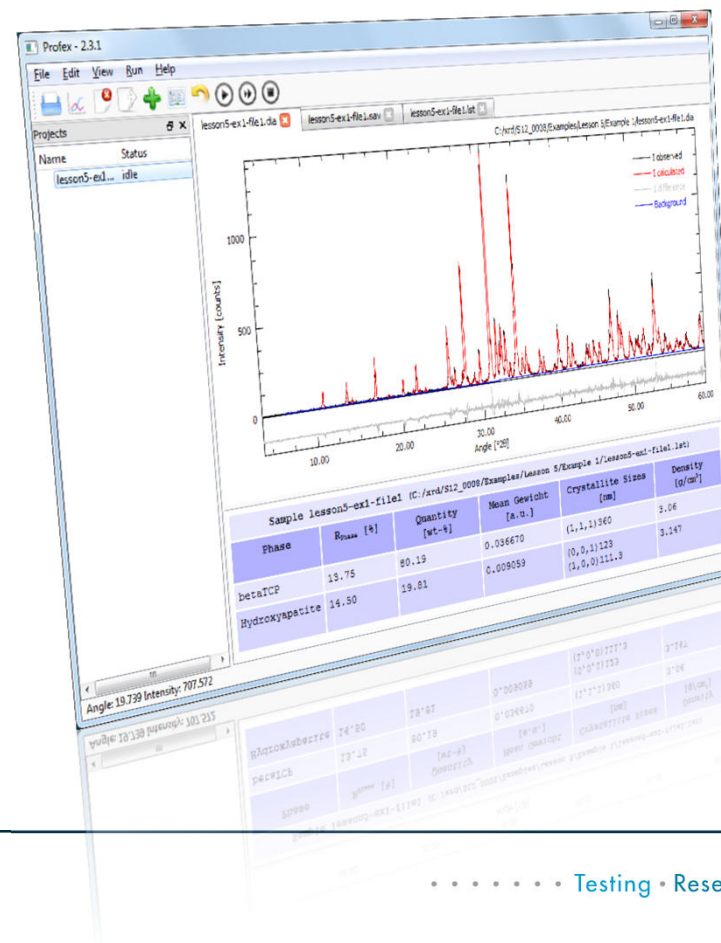
Profex

With Profex:

1. Load scan file
2. Use «Add phase» dialog to select phases, instrument, and generate control file
3. Run refinement

No need to:

- Copy structure / device files
- Change any file names
- Convert scan files



Lesson 6: Example 1

The screenshot shows the Profex 3.3.1 software interface. The main window displays a script with various parameters and comments. A context help window is open, showing the definition of the parameter EPS2. A red box highlights the context help window, and a red arrow points from a text box to the parameter definition in the script.

Context Help:
Place Cursor on a key word
Press «F1»

```
% Theoretical instrumental function
VERZERR=cubix-ads-10mm.geq
% Wavelength
LAMBDA=CU
% Polarization (CuKa with Graphite monochromator)
POL=sqr(cos(26.6*pi/180))
pi=2*acos(0)
% Phases
STRUC[1]=betaTCP.str
STRUC[2]=Hydroxylapatite.str
% Measured data
VAL[1]=lesson6-ex1-file1.xy
% Minimum Angle (2theta)
% WMIN=10
% Maximum Angle (2theta)
% WMAX=60
% Result list output
LIST=lesson6-ex1-file1.lst
% Peak list output
OUTPUT=lesson6-ex1-file1.par
% Diagram output
DIAGRAMM=lesson6-ex1-file1.dia
% Global parameters for zero point and sample displacement
EPS1=0
PARAM[1]=EPS2=0_-0.01^0.01
alpha3ratio=0.02
alpha3ratio=0
NTHREADS=8
PROTOKOLL=Y

sum=betaTCP+Hap
GOAL[1]=betaTCP/sum
GOAL[2]=Hap/sum
```

Context Help:
EPS2 is the specimen out of axis shift of the pattern (sample displacement error). May be refined within BGMN as a global parameter.

- $EPS2 * \sin(\Theta)$ for transmission geometry
- $EPS2 * \cos(\Theta)$ otherwise, e.g. for BRAGG-BRENTANO geometry

gives the pattern shift in **one** Theta in radians. Attention: Usually, the x axis of the pattern is **two** Theta.

Global Parameters and GOALS

Global Parameters and GOALS Chemistry

Wavelength: 1.54183 Å | Angle: 0.000° | Intensity: 0.000 cts | d-Spacing: 0.000 Å | Line 24, Column 11

Lesson 6: Example 1

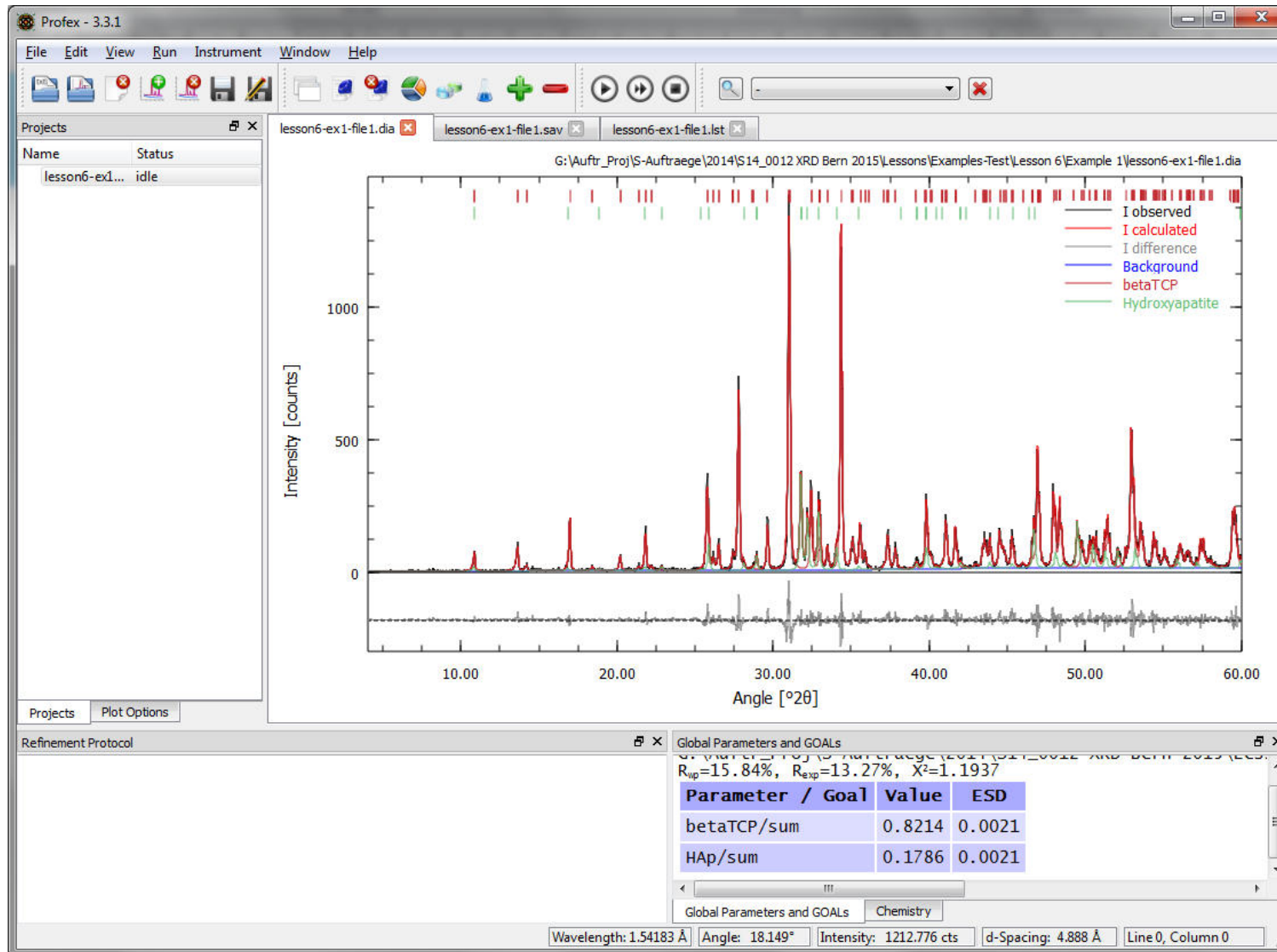
The screenshot displays the Profex 3.3.1 software interface. The main window contains a refinement protocol script with the following content:

```
% Theoretical instrumental function
VERZERR=cubix-ads-10mm.geq
% Wavelength
LAMBDA=CU
% Polarization (CuKa with Graphite monochromator)
POL=sqr(cos(26.6*pi/180))
pi=2*acos(0)
% Phases
STRUC[1]=betaTCP.str
STRUC[2]=Hydroxylapatite.str
% Measured data
VAL[1]=lesson6-ex1-file1.xy
% Minimum Angle (2theta)
% WMIN=10
% Maximum Angle (2theta)
% WMAX=60
% Result list output
LIST=lesson6-ex1-file1.lst
% Peak list output
OUTPUT=lesson6-ex1-file1.par
% Diagram output
DIAGRAMM=lesson6-ex1-file1.dia
% Global parameters for zero point and sample displacement
EPS1=0
PARAM[1]=EPS2=0_-0.01^0.01
alpha3ratio=0.02
betaratio=0
NTHREADS=8
PROTOKOLL=Y

sum=betaTCP+Hap
GOAL[1]=betaTCP/sum
GOAL[2]=Hap/sum
```

A red arrow points from a red box containing the text "Run the refinement" to the play button icon in the software's toolbar. The interface also shows a "Projects" panel on the left, a "Refinement Protocol" panel at the bottom, and a status bar at the very bottom with parameters: Wavelength: 1.5406 Å, Angle: 0.000°, Intensity: 0.000 cts, d-Spacing: 0.000 Å, Line 0, Column 0.

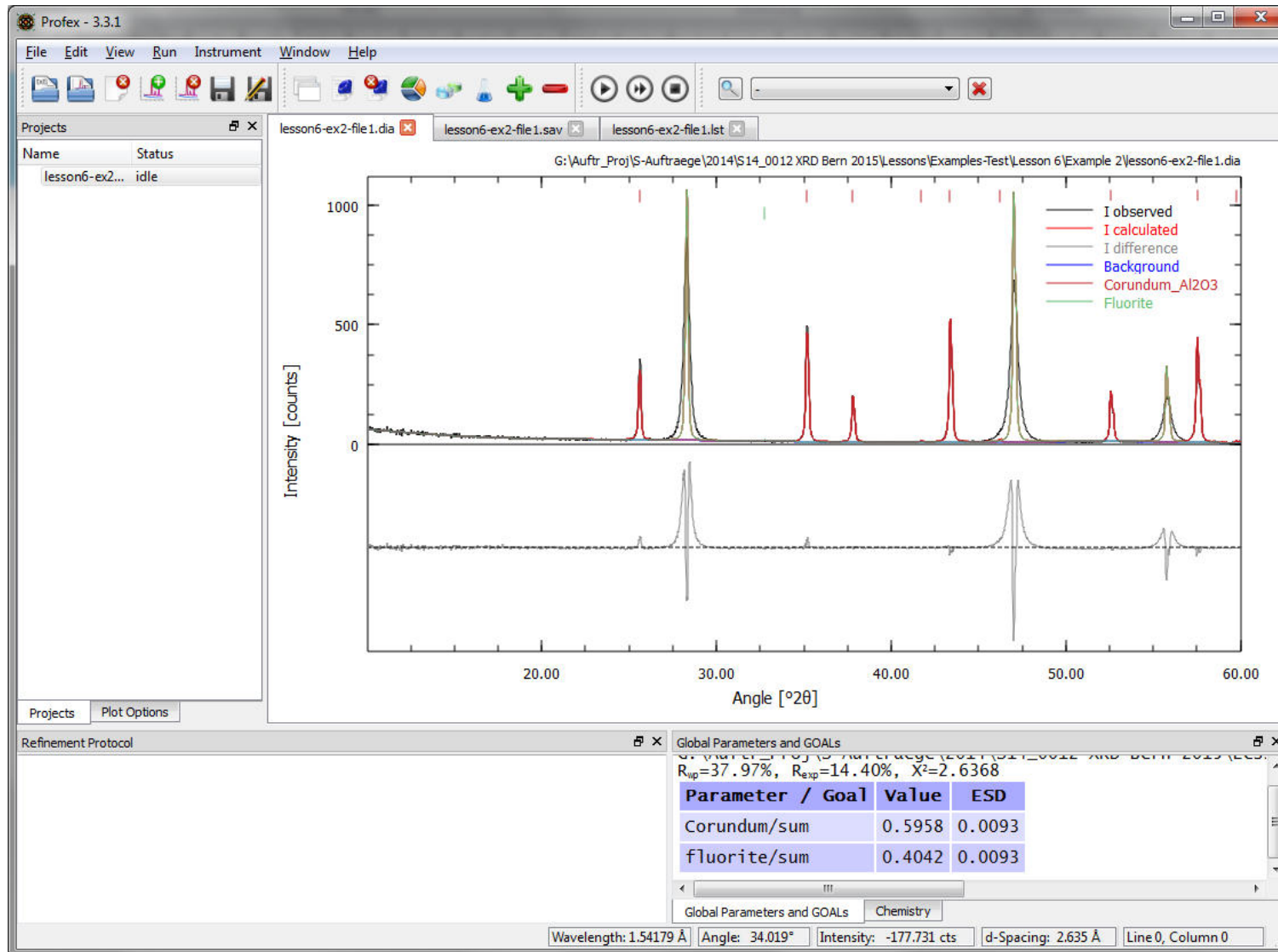
Lesson 6: Example 1



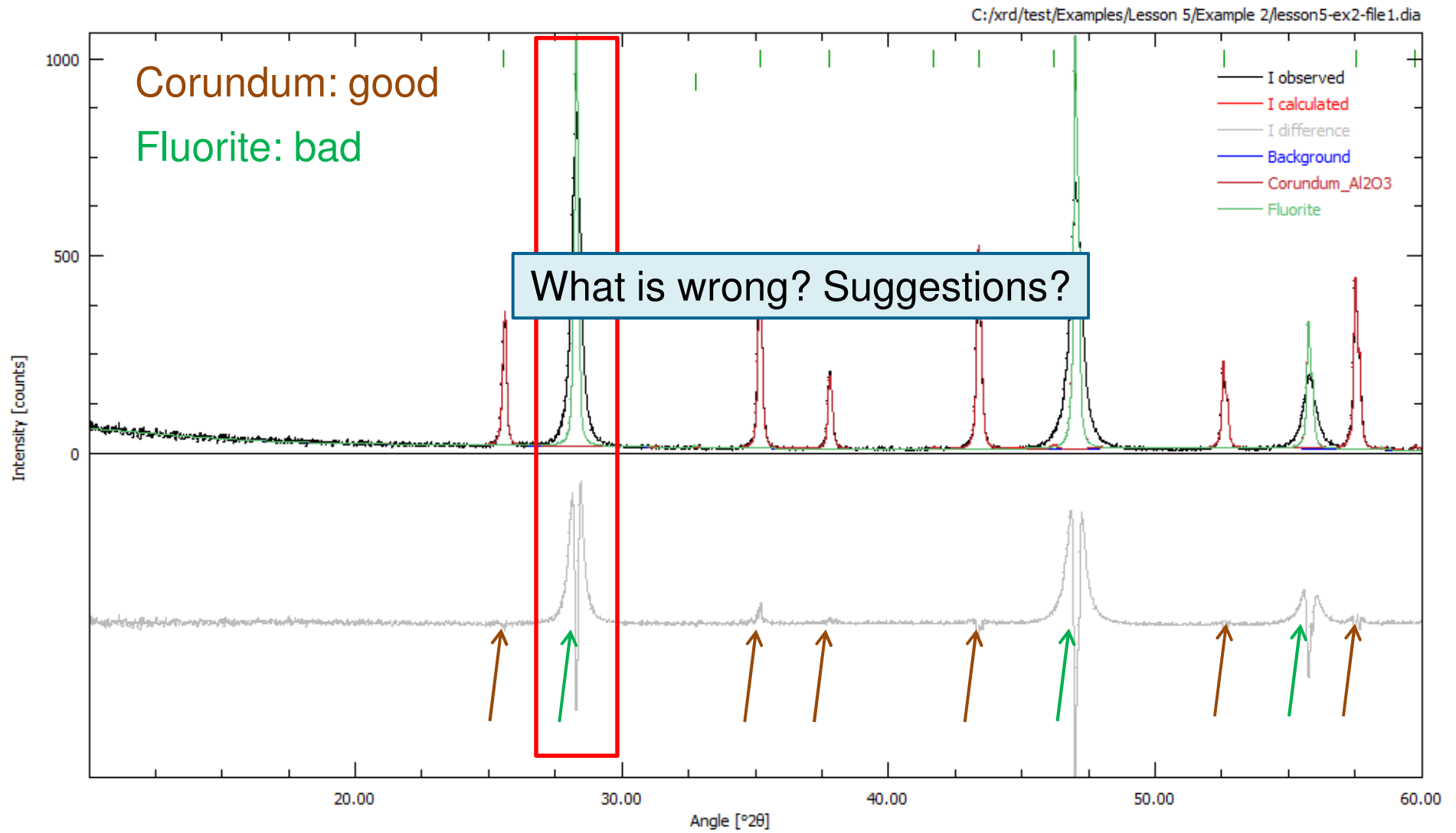
Lesson 6: Example 2

1. Open Graph File:
«Examples\Lesson 6\Example 2\lesson6-ex2.file1.xrdml»
2. Click «Add a phase» (+)
 - a) Select instrument: «pw1800-fds»
 - b) Select Phases:
«AL2O3-Corundum»
«Fluorite»
3. Run the refinement

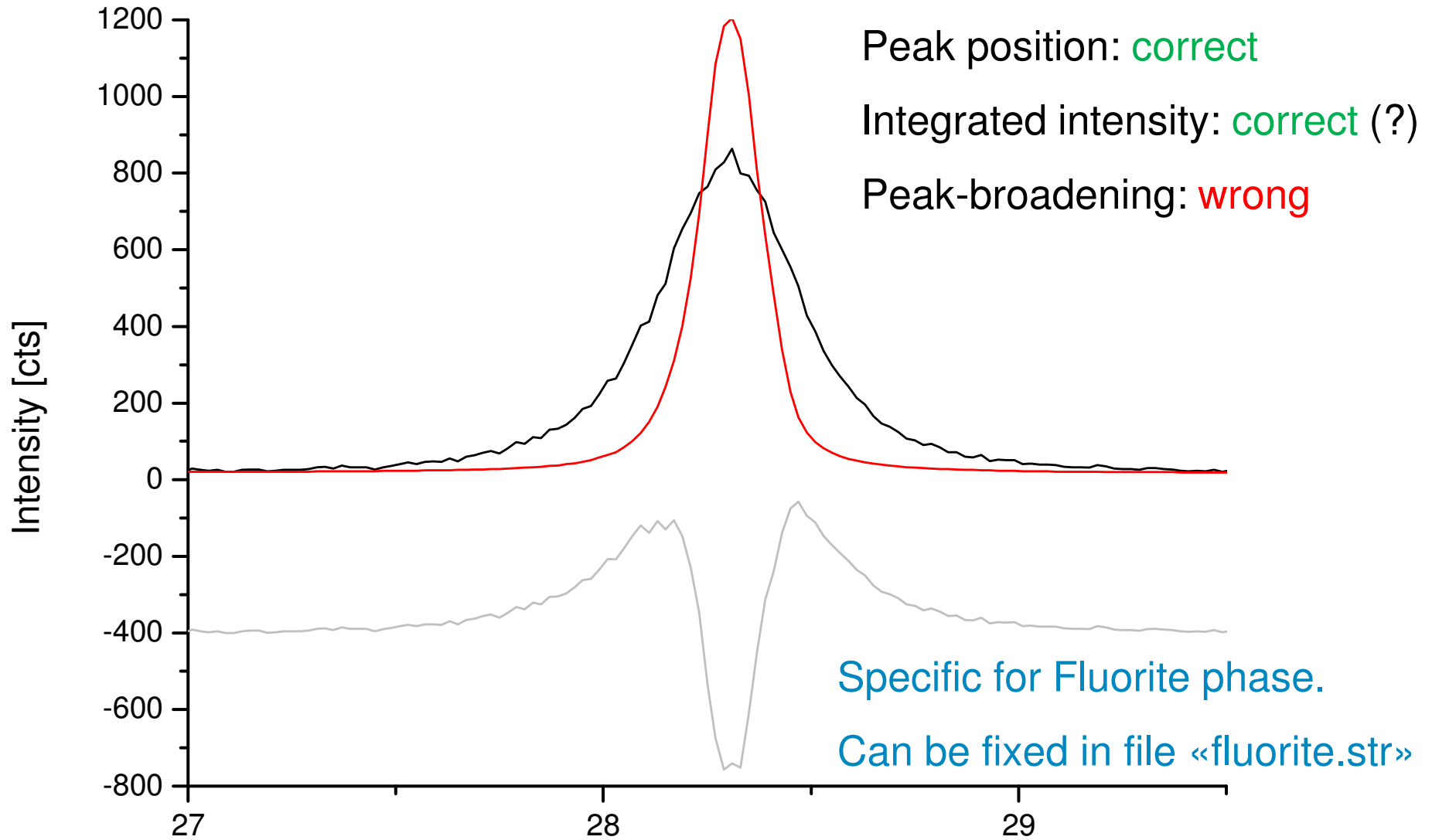
Lesson 6: Example 2



Lesson 6: Example 2



Lesson 6: Example 2



BGMN Structure Files (*.str)

«Open all project STR files»

PHASE=Fluorite // 04-002-2191
SpacegroupNo=225 HermannMauguin=F4/m-32/m //
PARAM=A=0.5463_0.54^0.55 //
RP=4 k1=0 k2=0 PARAM=B1=0_0^0.003 PARAM=GEWICHT=0.1_0 //
d=10 //
GOAL=GrainSize(1,1,1) //
GOAL=my //
GOAL=d //
GOAL:fluorite=GEWICHT*ifthenelse(ifdef(d),exp(my*d*3/4),1)
E=CA+2 wyckoff=a TDS=0.0041
E=F-1 wyckoff=c TDS=0.0062

Global Parameters and GOALS
R_{wp}=37.97%, R_{exp}=14.40%, X²=2.6368

Parameter / Goal	Value	ESD
Corundum/sum	0.5958	0.0093
fluorite/sum	0.4042	0.0093

Global Parameters and GOALS Chemistry
Wavelength: 1.54179 Å Angle: 0.000° Intensity: 0.000 cts d-Spacing: 0.000 Å Line 0, Column 0

BGMN Structure Files (*.str)

```

PHASE=Fluorite // 04-002-2191
SpacegroupNo=225 HermannMauguin=F4/m-32/m //
PARAM=A=0.5463_0.54^0.55 //
RP=4 k1=0 k2=0 PARAM=B1=0_0^0.003 PARAM=GEWICHT=0.1_0 //
d=10 //
GOAL=GrainSize(1,1,1) //
GOAL=my //
GOAL=d //
GOAL:fluorite=GEWICHT*ifthenelse(ifdef(d),exp(my*d*3/4),1)
E=CA+2 Wyckoff=a TDS=0.0041
E=F-1 Wyckoff=c TDS=0.0062
    
```

Phase name // Database reference

Space group number & H-M symbol

Unit Cell: *a* axis (nm)

Peak profile parameters

Mean particle size (μm), optional

Goals (optional, these values are reported in the results file)

List of atomic positions

Full notation:

E=CA+2(1) Wyckoff=a x=0.0 y=0.0 z=0.0 TDS=0.0041

Element

Wyckoff sequence

Thermal displacement parameter
(B_{iso} [nm²])

Site occupancy

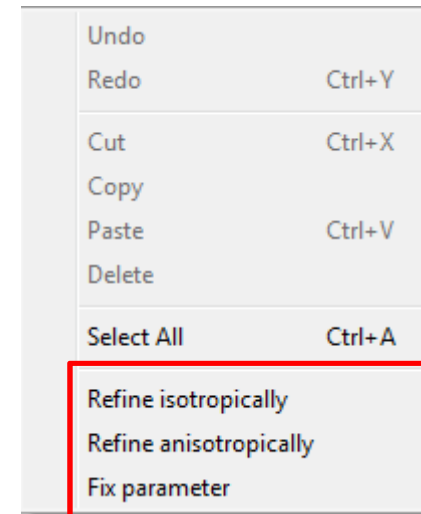
Fractional coordinates

BGMN Structure Files (*.str)

```

PHASE=Fluorite // 04-002-2191
SpacegroupNo=225 HermannMauguin=F4/m-32/m //
PARAM=A=0.5463_0.54^0.55 //
RP=4 k1=0 k2=0 PARAM=B1=0_0^0.003 PARAM=GEWICHT=0.1_0 //
d=10 //
GOAL=GrainSize(1,1,1) //
GOAL=my //
GOAL=d //
GOAL:fluorite=GEWICHT*ifthenelse(ifdef(d),exp(my*d*3/4),1)
E=CA+2 Wyckoff=a TDS=0.0041
E=F-1 Wyckoff=c TDS=0.0062
    
```

Right mouse button on a parameter:



Fix parameter:	Refined parameter:	Refined parameter with limits:
A=0.5463	PARAM=A=0.5463	PARAM=A=0.5463_0.54^0.55
Name Value	Release for refinement Name Starting value	Release for refinement Name Starting value Lower limit Upper limit

Lesson 6: Example 2

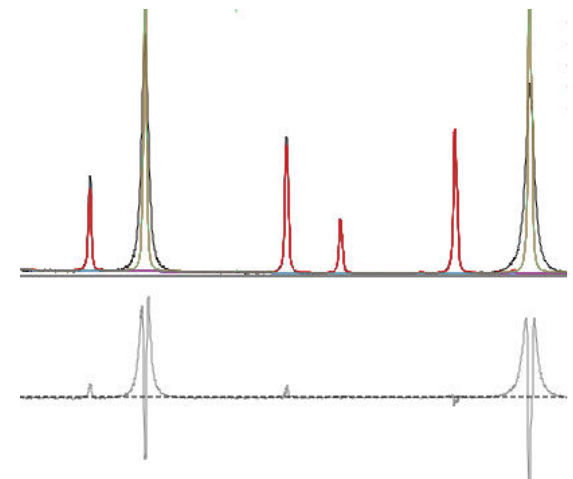
```
PHASE=Fluorite // 04-002-2191
SpacegroupNo=225 HermannMauguin=F4/m-32/m //
PARAM=A=0.5463_0.54^0.55 //
RP=4 k1=0 k2=0 PARAM=B1=0_0^0.003 PARAM=GEWICHT=0.1_0 //
d=10 //
GOAL=GrainSize(1,1,1) //
GOAL=my //
GOAL=d //
GOAL:fluorite=GEWICHT*ifthenelse(ifdef(d),exp(my*d*3/4),1)
E=CA+2 Wyckoff=a TDS=0.0041
E=F-1 Wyckoff=c TDS=0.0062
```

In Lesson 6, Example 2, peak broadening was not fitted correctly

Peak shape is controlled here

B1: peak broadening caused by crystallite size

k2: peak broadening caused by micro-strain



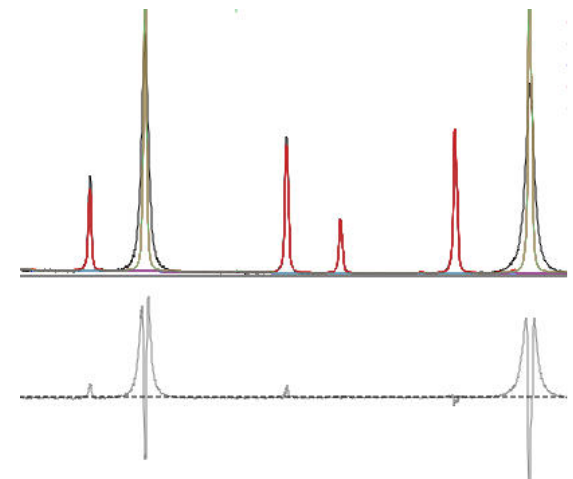
See <http://www.bgm.de/variables.html#real> for RP=4 and k1=0

Lesson 6: Example 2

```
PHASE=Fluorite // 04-002-2191
SpacegroupNo=225 HermannMauguin=F4/m-32/m //
PARAM=A=0.5463_0.54^0.55 //
RP=4 k1=0 k2=0 PARAM=B1=0_0^0.003 PARAM=GEWICHT=0.1_0 //
d=10 //
GOAL=GrainSize(1,1,1) //
GOAL=my //
GOAL=d //
GOAL:fluorite=GEWICHT*ifthenelse(ifdef(d),exp(my*d*3/4),1)
E=CA+2 Wyckoff=a TDS=0.0041
E=F-1 Wyckoff=c TDS=0.0062
```

B1: refined, but limited to the range 0.000 – 0.003
(upper limit may be too strict)

k2: micro strain effect, not refined (necessary?)



Lesson 6: Example 2

Change:

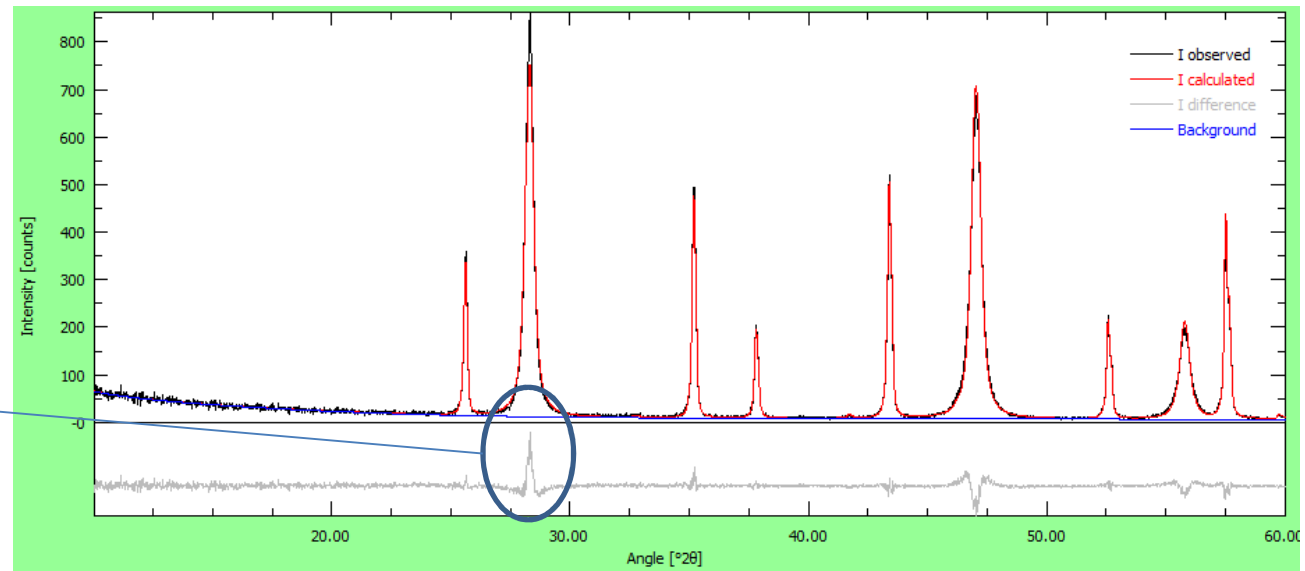
```
RP=4 k1=0 k2=0 PARAM=B1=0_0^0.003 PARAM=GEWICHT=0.1_0 //
```

To:

```
RP=4 k1=0 k2=0 PARAM=B1=0_0^0.03 PARAM=GEWICHT=0.1_0 //
```

Repeat Refinement

Better, but not perfect.
Is there microstrain?



Lesson 6: Example 2

Change:

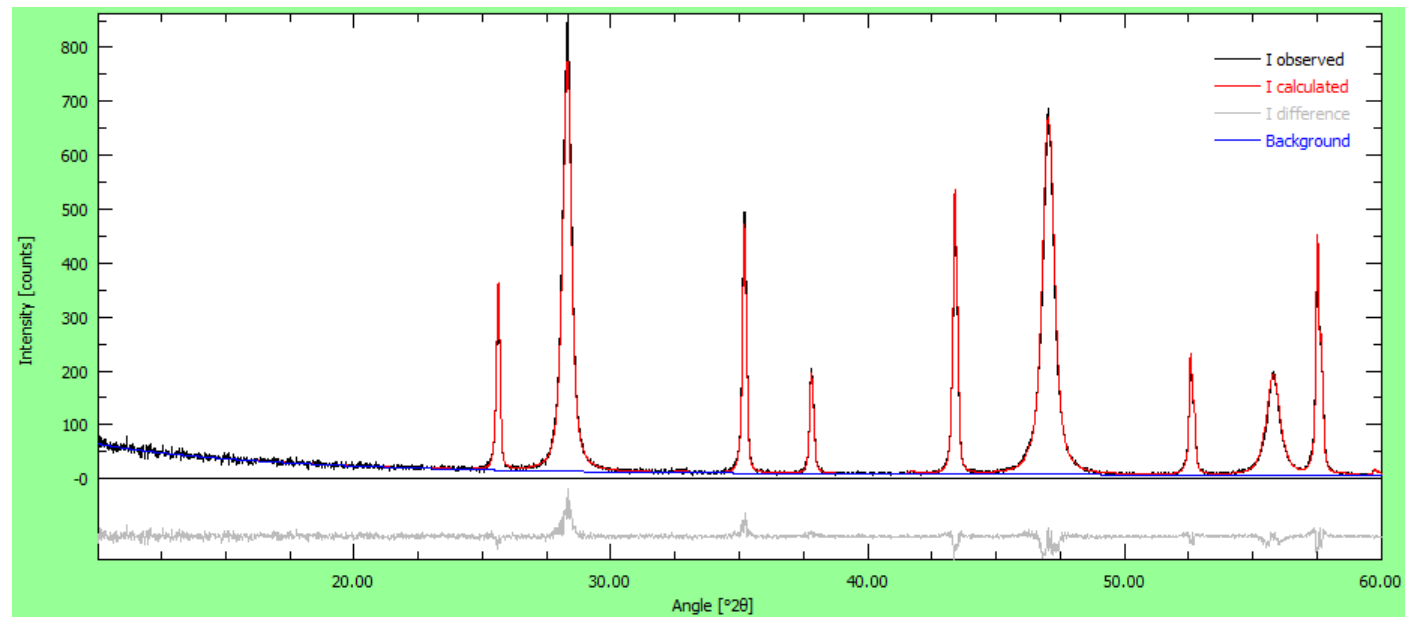
```
RP=4 k1=0 k2=0 PARAM=B1=0_0^0.03 PARAM=GEWICHT=0.1_0 //
```

To:

```
RP=4 k1=0 PARAM=k2=0_0 PARAM=B1=0_0^0.03 PARAM=GEWICHT=0.1_0 //
```

Repeat Refinement

Better, but **still**
not perfect.



Lesson 6: Example 2

Preferred Orientation / Texture:

- Refine «GEWICHT» anisotropically:
 - Right mouse button on GEWICHT
 - «Refine anisotropically»

Changes:

```
RP=4 k1=0 PARAM=k2=0_0 PARAM=B1=0_0^0.03 PARAM=GEWICHT=0.1_0 //
```

To:

```
RP=4 k1=0 PARAM=k2=0_0 PARAM=B1=0_0^0.03 GEWICHT=SPHAR4 //
```

Repeat Refinement

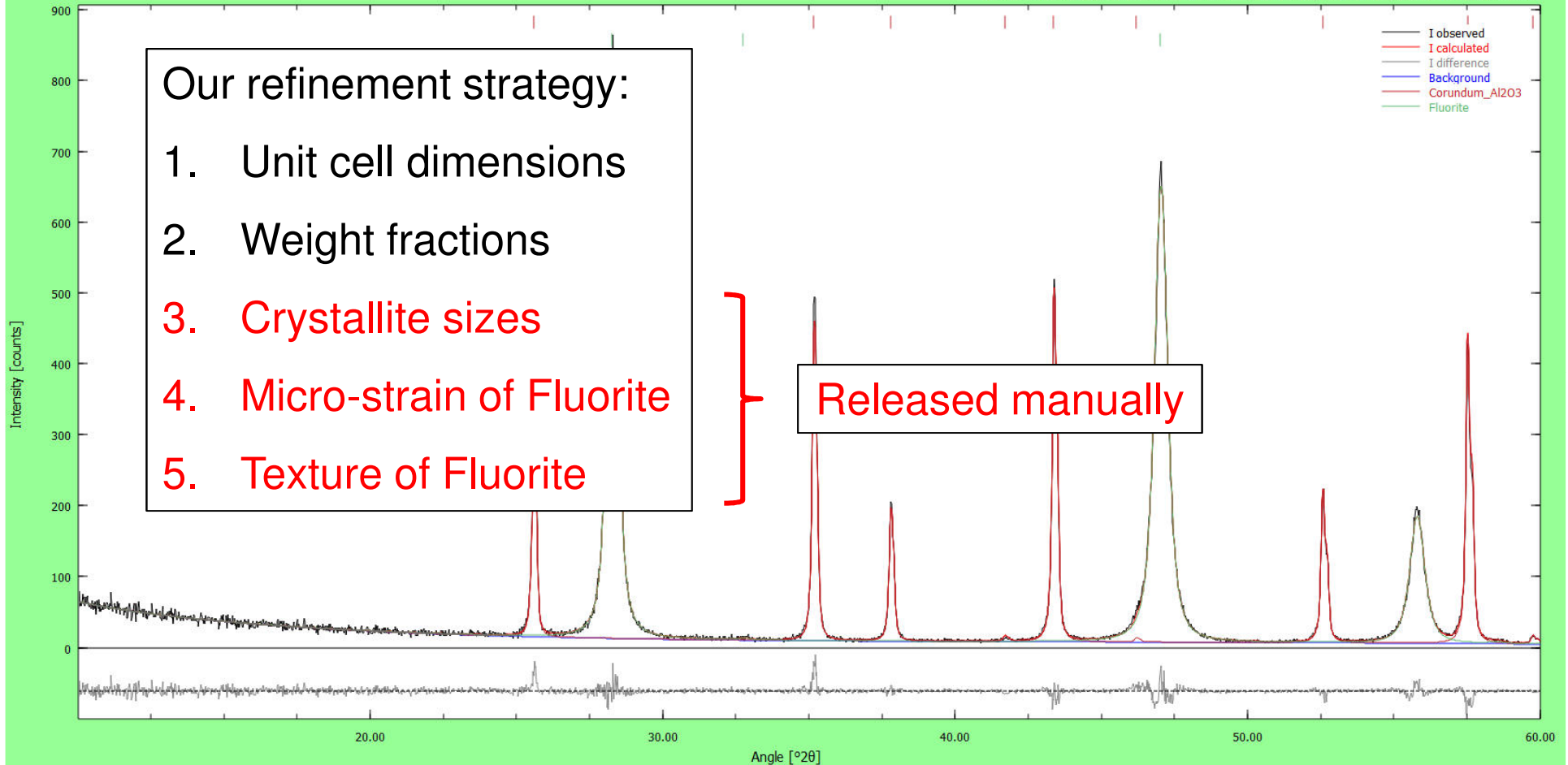
Lesson 6: Example 2

G:\Auftr_Proj\S-Auftraege\2014\S14_0012 XRD Bern 2015\Lessons\Examples-Test\Lesson 6\Example 2\Lesson6-ex2-file1.dia

Our refinement strategy:

1. Unit cell dimensions
2. Weight fractions
3. Crystallite sizes
4. Micro-strain of Fluorite
5. Texture of Fluorite

Released manually



Lesson 6: Example 2

The screenshot displays the Profex 3.3.1 interface. The main window shows the output of a Rietveld refinement, with a red arrow pointing to the text "Results in *.LST file". The output includes statistical data, global parameters, and local parameters for the phase Corundum_A1203. A red arrow also points to a "Summary table" at the bottom right, which is a table with columns for Parameter / Goal, Value, and ESD.

Results in *.LST file

Summary table

Parameter / Goal	Value	ESD
Corundum/sum	0.4739	0.0041
fluorite/sum	0.5261	0.0041

Summary: Structure Files (*.str)

- Structure file database (*.str) is stored in
...\\Profex-BGMN-Bundle-3.3.1\\Profex\\Structures
- Copied by Profex to the location of the scan file
- They contain:
 - Space group information
 - Unit cell dimensions
 - Profile parameters
 - Scaling (weight fraction)
 - List of atoms (element, SOF, Wyckoff sequence, fract. coordinates, TDS)
 - Optional «Goals»: Results / values printed to the results file (*.lst)
- Release parameters for refinement:
 - «PARAM=»
 - Optionally (recommended!): «_lowerLimit» and «^upperLimit»

Summary: Structure Files (*.str)

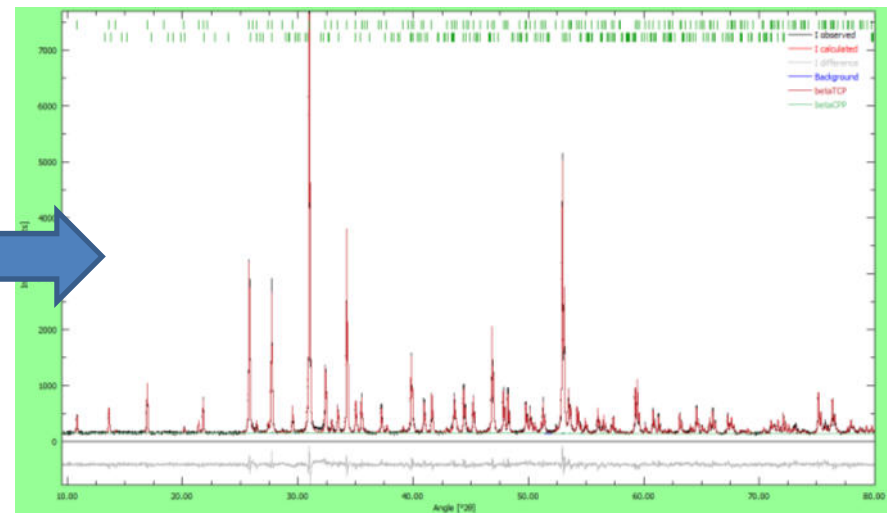
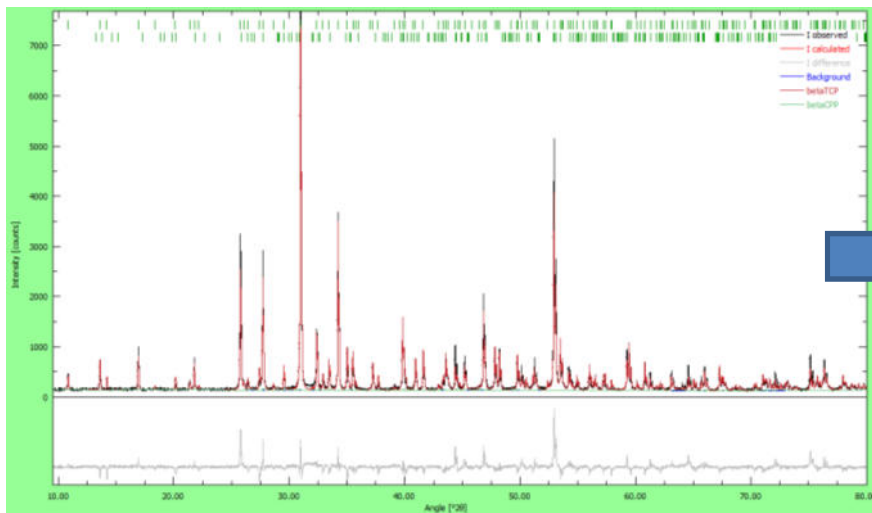
Refinements are «fine tuned» by editing Structure Files:

Commonly:

- Set reasonable upper and lower limits
- Control peak broadening
- Control texture / preferred orientation

Rarely:

- Control structural parameters:
 - atomic coordinates
 - site occupancies
 - thermal displacement parameters



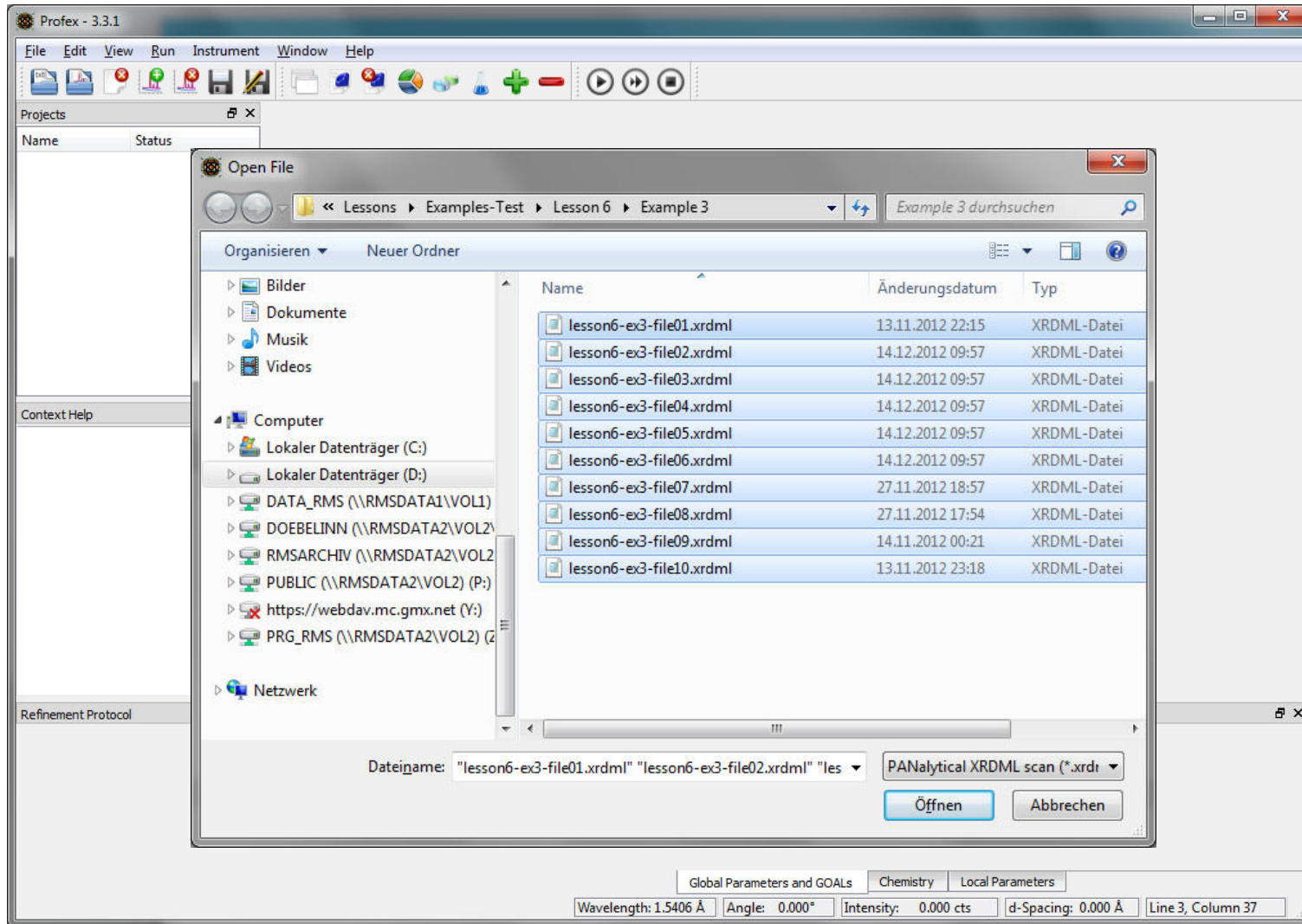
Structure Databases

STR files included in Profex bundle
(created manually by Nicola Doebelin)

<http://www.bgmnn.de/download-structures.html>

More on Structure Files:
Lesson 8: Creating Structure Files

Lesson 6: Example 3 - Batch Refinement



Lesson 6: Example 3 - Batch Refinement

The screenshot shows the Profex 3.3.1 software interface. On the left, a 'Projects' list contains ten files from 'lesson6-ex3-file01' to 'lesson6-ex3-file10', all with a status of 'idle'. A red circle highlights a green plus icon in the toolbar. The main window displays an XRD pattern for 'lesson6-ex3-file01 0', plotting Intensity [counts] on the y-axis (0 to 1000) against Angle [°2Theta] on the x-axis (10.00 to 60.00). The plot shows several sharp peaks, with the most intense at approximately 32° 2θ. Below the plot, there are tabs for 'Refinement Protocol' and 'Global Parameters and GOALS'. At the bottom, a status bar shows: Wavelength: 1.5406 Å, Angle: 0.000°, Intensity: 0.000 cts, d-Spacing: 0.000 Å, Line 3, Column 37.

Create control file for first scan
Instrument: cubix-ads-10mm
Phase 1: betaTCP
Phase 2: hydroxylapatite

Lesson 6: Example 3 - Batch Refinement

Profex - 3.3.1

File Edit View Run Instrument Window Help

Projects

Name	Status
lesson6-ex3-file01	idle
lesson6-ex3-file02	idle
lesson6-ex3-file03	idle
lesson6-ex3-file04	idle
lesson6-ex3-file05	idle
lesson6-ex3-file06	idle
lesson6-ex3-file07	idle
lesson6-ex3-file08	idle
lesson6-ex3-file09	idle
lesson6-ex3-file10	idle

lesson6-ex3-file01.xrdml lesson6-ex3-file01.sav*

```
% Theoretical instrumental function
VERZERR=cubix-ads-10mm.geq
% Wavelength
LAMBDA=CU
% Polarization (CuKa with Graphite monochromator)
POL=sqr(cos(26.6*pi/180))
pi=2*acos(0)
% Phases
STRUC[1]=betaTCP.str
STRUC[2]=Hydroxylapatite.str
% Measured data
VAL[1]=lesson6-ex3-file01.xy
% Minimum Angle (2theta)
% WMIN=10
% Maximum Angle (2theta)
% WMAX=60
% Result list output
LIST=lesson6-ex3-file01.lst
% Peak list output
OUTPUT=lesson6-ex3-file01.par
% Diagram output
DIAGRAM=lesson6-ex3-file01.dia
% Global parameters for zero point and sample displacement
EPS1=0
PARAM[1]=EPS2=0_-0.01^0.01
alpha3ratio=0.02
betaratio=0
NTHREADS=8
PROTOKOLL=Y

sum=betaTCP+HAP
GOAL[1]=betaTCP/sum
```

Context Help

Refinement Protocol Global Parameters and GOALS

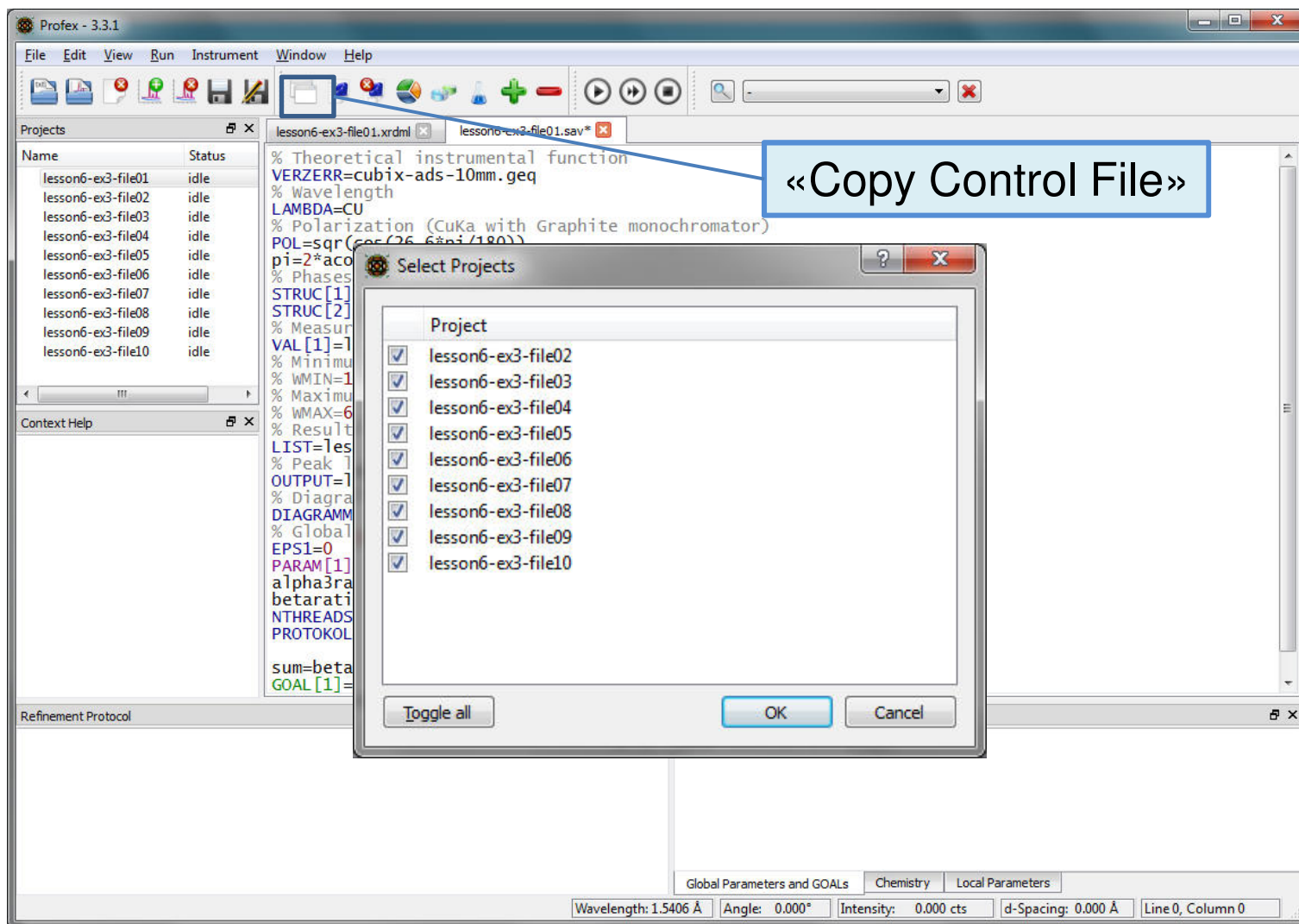
Global Parameters and GOALS Chemistry Local Parameters

Wavelength: 1.5406 Å Angle: 0.000° Intensity: 0.000 cts d-Spacing: 0.000 Å Line 0, Column 0

Sav file created for first scan

But not for the other scans

Lesson 6: Example 3 - Batch Refinement



Lesson 6: Example 3 - Batch Refinement

The screenshot shows the Profex 3.3.1 interface. On the left, a 'Projects' table lists ten projects from 'lesson6-ex3-file01' to 'lesson6-ex3-file10', all with a status of 'idle'. The main window displays a control file with the following content:

```
% Theoretical instrumental function
VERZERR=cubix-ads-10mm.geq
% Wavelength
LAMBDA=CU
% Polarization (CuKa with Graphite monochromator)
POL=sqr(cos(26.6*pi/180))
pi=2*acos(0)
% Phases
STRUC[1]=betaTCP.str
STRUC[2]=Hydroxylapatite.str
% Measured data
VAL[1]=lesson6-ex3-file01.xy
% Minimum Angle (2theta)
% WMIN=10
% Maximum Angle (2theta)
% WMAX=60
% Result list output
LIST=lesson6-ex3-file01.lst
% Peak list output
OUTPUT=lesson6-ex3-file01.par
% Diagram output
DIAGRAM=lesson6-ex3-file01.dia
% Global parameters for zero point and sample displacement
EPS1=0
PARAM[1]=EPS2=0_-0.01^0.01
alpha3ratio=0.02
betaratio=0
NTHREADS=8
PROTOKOLL=Y

sum=betaTCP+HAP
GOAL[1]=betaTCP/sum
```

A callout box on the right contains the following text:

- Copies the control file to all projects
- Adjusts all input/output file names

Arrows point from the callout box to the lines in the control file: 'lesson6-ex3-file01.xy', 'lesson6-ex3-file01.lst', 'lesson6-ex3-file01.par', and 'lesson6-ex3-file01.dia'.

Lesson 6: Example 3 - Batch Refinement

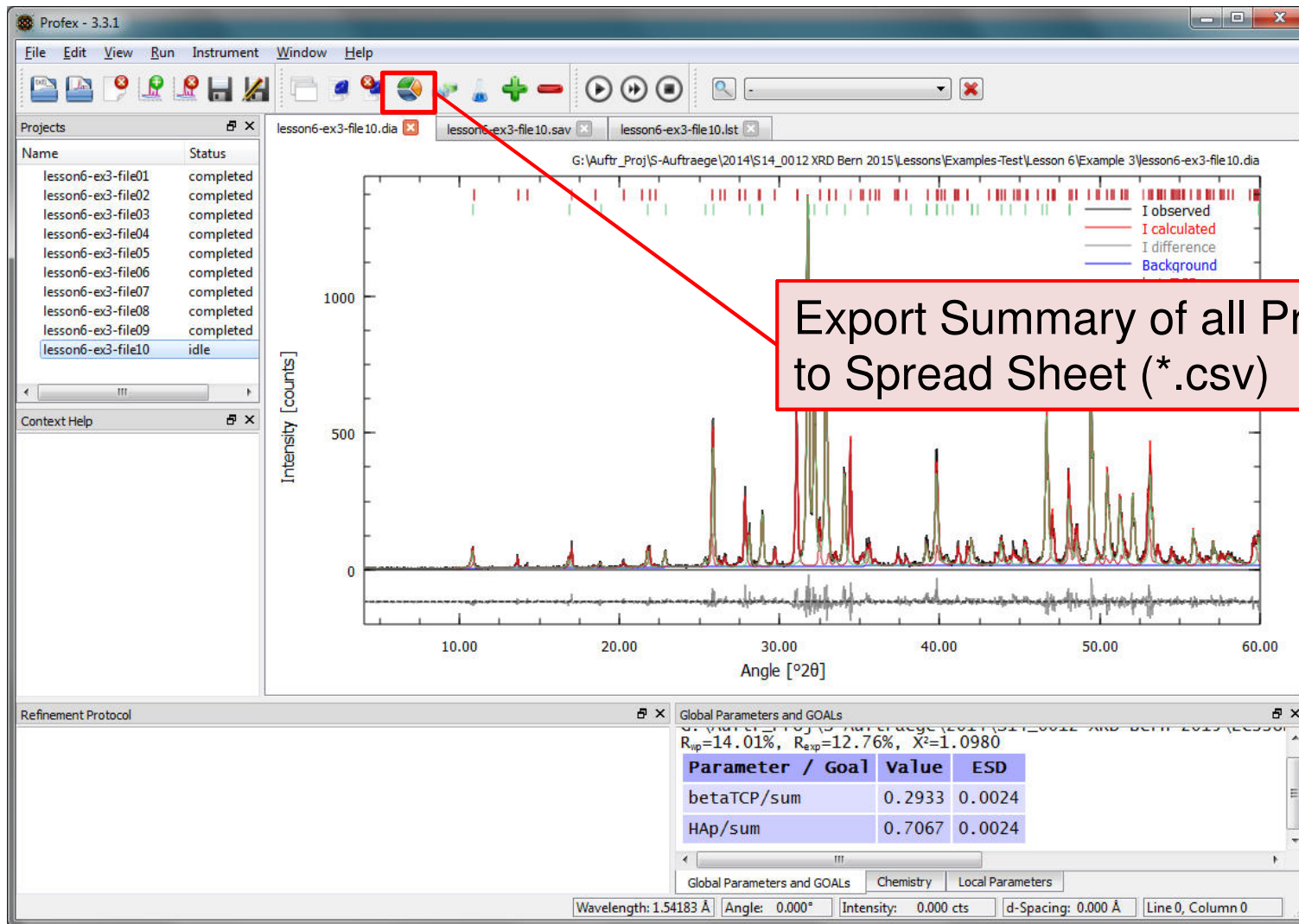
The screenshot displays the Profex 3.3.1 interface. The 'Projects' list on the left shows the status of various files: lesson6-ex3-file01 through lesson6-ex3-file04 are 'completed', lesson6-ex3-file05 is 'running...', and lesson6-ex3-file06 through lesson6-ex3-file10 are 'scheduled'. A 'Select Projects' dialog box is open in the center, with all ten projects checked. The background plot shows a diffraction pattern with a peak at approximately 50.00 degrees. The 'Refinement Protocol' table at the bottom provides detailed data for each step.

Step	1	2	3	4
3	1.756702E+04	2.606E+04	2.620E-02	1.000
4	1.070645E+04	1.204E+04	4.150E-02	1.000
5	8.492882E+03	3.840E+03	1.686E-02	1.000
6	6.538199E+03	2.448E+03	3.373E-03	1.000
7	4.869493E+03	2.498E+03	6.745E-04	1.000
8	4.600850E+03	4.880E+02	1.349E-04	1.000
9	4.594503E+03	1.247E+01	2.698E-05	1.000
10	4.593678E+03	1.616E+00	8.758E-06	1.000

Global Parameters and GOALS: Wavelength: 1.5406 Å, Angle: 10.668°, Intensity: 633.870 cts, d-Spacing: 8.286 Å, Line 0, Column 0

Start Batch Refinement

Lesson 6: Example 3 - Batch Refinement



Lesson 6: Example 3 - Batch Refinement

File	Sample	Parameter / Goal	Value	ESD
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file01.lst	lesson6-ex3-file01	betaTCP/sum	0.294	0.0025
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file01.lst	lesson6-ex3-file01	HAp/sum	0.706	0.0025
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file02.lst	lesson6-ex3-file02	betaTCP/sum	0.2887	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file02.lst	lesson6-ex3-file02	HAp/sum	0.7113	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file03.lst	lesson6-ex3-file03	betaTCP/sum	0.2929	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file03.lst	lesson6-ex3-file03	HAp/sum	0.7071	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file04.lst	lesson6-ex3-file04	betaTCP/sum	0.2941	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file04.lst	lesson6-ex3-file04	HAp/sum	0.7059	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file05.lst	lesson6-ex3-file05	betaTCP/sum	0.2934	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file05.lst	lesson6-ex3-file05	HAp/sum	0.7066	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file06.lst	lesson6-ex3-file06	betaTCP/sum	0.2918	0.0023
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file06.lst	lesson6-ex3-file06	HAp/sum	0.7082	0.0023
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file07.lst	lesson6-ex3-file07	betaTCP/sum	0.2899	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file07.lst	lesson6-ex3-file07	HAp/sum	0.7101	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file08.lst	lesson6-ex3-file08	betaTCP/sum	0.2908	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file08.lst	lesson6-ex3-file08	HAp/sum	0.7092	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file09.lst	lesson6-ex3-file09	betaTCP/sum	0.2896	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file09.lst	lesson6-ex3-file09	HAp/sum	0.7104	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file10.lst	lesson6-ex3-file10	betaTCP/sum	0.2933	0.0024
G:/Auftr_Proj/S-Auftraege/2014/S14_0012 XRD Bern 2015/Lessons/Examples-Test/Lesson 6/Example 3/lesson6-ex3-file10.lst	lesson6-ex3-file10	HAp/sum	0.7067	0.0024

User Manual

Profex

Version 3.3
BGMN Backend
September 14, 2014

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