# Synthesizer Ver. 0.3.1

User's Guide

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## Contents

0	Inti	roduction
1	Dat	a Preparation
<b>2</b>	Too	l Installation
3	Bas	ic Operations
	3.1	Starting the Tool
	3.2	Tool Tips
	3.3	Entering Setting Information
	3.4	Manual Operation
	3.5	Automatic Operation
	3.6	Finishing the Tool10
4	Vist	ual Checking of the Images 11
<b>5</b>	Adv	vanced or Less Frequently Used Operations
	5.1	Partial Operation
	5.2	Preference Changes
	5.3	Temporary Preference Changes
	5.4	Developer Options

## 0 Introduction

- a "Synthesizer" is a tool for making better synthesized images with less missing values from detector output raw images, which include significant unusable pixels inevitable from the detector structure design.
- b This is a detailed and almost complete operation guide for users, corresponding to the version 0.3.1 of "Synthesizer".
- c A simpler document is available as "HOW\_TO\_USE.txt" in the tool installation folder.
- d It is assumed that you are already familiar with the measurement operations at Photon Factory, KEK.

## 1 Data Preparation

- a Prepare the following data in a folder.
  - Measured data image files.
    - File postfixes are usually appended as follows:
      - \*\_0\_0000.tif original data,
      - \*\_1\_0000.tif first shifted data,
      - \*\_2\_0000.tif second shifted data,
      - where \* is the measured sample id.
  - Measurement log file.
  - Pilatus counter file(s).
  - SAngler mask file
- b See the figure below for an example.
- c For each sample, the tool can synthesize two or three images named regularly after the sample id.
- d However, it is desirable that, for each sample, you prepare three images with different positioning to get well-synthesized images.

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		Agbri_Centeroyage	गर <b>्र</b>
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♪ **年に1 わ	名前	日付時刻	種類
	20151019cent01 0 00000.mask	2015/10/23 7:47	MASK ファイル
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📕 ダウンロード	AqBh002_1_00000.tif	2015/10/23 13:11	TIFF イメージ
📃 デスクトップ	AgBh002_2_00000.tif	2015/10/23 13:11	TIFF イメージ
📃 最近表示した場所	AgBh003_0_0000.tif	2015/10/23 13:11	TIFF イメージ
Synthesized2	AgBh003_1_00000.tif	2015/10/23 13:11	TIFF イメージ
	AgBh003_2_00000.tif	2015/10/23 13:11	TIFF イメージ
陶 ライブラリ	AgBh004_0_0000.tif	2015/10/23 13:11	TIFF イメージ
📇 Cit	AgBh004_1_00000.tif	2015/10/23 13:11	TIFF イメージ
	AgBh004_2_00000.tif	2015/10/23 13:11	TIFF イメージ
	AgBh005_0_0000.tif	2015/10/23 13:11	TIFF イメージ
📔 ビクチャ	AgBh005_1_00000.tif	2015/10/23 13:11	TIFF イメージ
📑 ビデオ	😹 AgBh005_2_00000.tif	2015/10/23 13:11	TIFF イメージ
🎝 ミュージック	😹 AgBh006_0_0000.tif	2015/10/23 13:11	TIFF イメージ
	😹 AgBh006_1_00000.tif	2015/10/23 13:11	TIFF イメージ
ঝ ホームグループ	🛃 AgBh006_2_00000.tif	2015/10/23 13:11	TIFF イメージ
	🛃 AgBh007_0_0000.tif	2015/10/23 13:11	TIFF イメージ
	🛃 AgBh007_1_00000.tif	2015/10/23 13:11	TIFF イメージ
	🛃 AgBh007_2_00000.tif	2015/10/23 13:11	TIFF イメージ
windows (C:)	🛃 AgBh008_0_0000.tif	2015/10/23 13:11	TIFF イメージ
HP_RECOVERY (D:)	🛃 AgBh008_1_00000.tif	2015/10/23 13:11	TIFF イメージ
👝 HP_TOOLS (E:)	🛃 AgBh008_2_00000.tif	2015/10/23 13:11	TIFF イメージ
🦲 ボリューム (F:)	currentdata.txt	2015/10/23 13:11	テキスト ドキュ.
	measurement_AgBh_center.log	2015/12/07 14:44	テキスト ドキュ.
👊 ネットワーク	PilatusCounter_AgBh002_2015-10-23.txt	2015/10/23 15:09	テキスト ドキュ.
PESAXS02	PilatusCounter_AgBh003_2015-10-23.txt	2015/12/24 12:23	テキスト ドキュ.
12 110/0002	PilatusCounter_AgBh004_2015-10-23.txt	2015/12/24 12:23	テキスト ドキュ.
	PilatusCounter_AgBh005_2015-10-23.txt	2015/12/24 12:23	テキスト ドキュ.
	PilatusCounter_AgBh006_2015-10-23.txt	2015/12/24 12:23	テキスト ドキュ.
	PilatusCounter_AgBh007_2015-10-23.txt	2015/12/24 12:23	テキスト ドキュ.
	PilatusCounter_AgBh008_2015-10-23.txt	2015/12/24 12:23	テキスト ドキュ. 🔻
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Fig. 1-1 Example of a data folder

- 2 Tool Installation
  - a Download a suitable distribution file from

http://pfweis.kek.jp/~saxs/software/Synthesizer.html synthesizer-0.3.1-x64.zip (for 64bit Windows) synthesizer-0.3.1-x86.zip (for 32bit Windows)

b Unzip the distribution file into an arbitrary folder aside from image data folders. No other action is necessary. The folder should look like the figure below.

Fig. 2-1 Example of a tool installation folder

G ● ● ● 《 ポリューム (F:) → Demo → systhesizer-0.3.1-x64 → ◆ → systhesizer-0.3.1-x64の検索      P								
ファイル( <u>E</u> ) 編集( <u>E</u> ) 表示( <u>V</u>	') ツール(I) ヘルプ( <u>H</u> )							
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	▲ 名前 ▲	更新日時	種類 サ					
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	\mu doc	2016/01/07 10:12	ファイル フォルダー					
🌉 コンピューター	🕕 lib	2016/01/07 9:52	ファイル フォルダー					
🏭 Windows (C:)	🚽 🌗 synthesizer	2016/01/07 9:53	ファイル フォルダー					
HP_RECOVERY (D:)	= 🐌 test	2016/01/07 9:53	ファイル フォルダー					
HP TOOLS (E:)	HOW_TO_USE.txt	2016/01/06 17:44	テキスト ドキュメント					
→ ボリューム (E:)	HOW_TO_USE-jp.txt	2016/01/06 17:29	テキスト ドキュメント					
	🚳 run.bat	2015/12/15 9:20	Windows バッチ ファ					
	🔘 run.exe	2015/12/15 9:16	アプリケーション					
DetectorPositionCha								
Development	<b>▼</b>		4					
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## 3 Basic Operations

- 3.1 Starting the Tool
  - a Run the tool by double clicking "run.exe" to get the initial main window as shown below.<sup>1</sup>

#### Fig. 3-1 Initial main window

O Detector Image Synthesizer 0.3.1 (2016-01-07 python 3.5.0 64bit)	
Options	
Setting Information Entries Clear press to clear the following entries	
Measured Image Folder: <folder></folder>	must be entered manually
Measurement Log File>	automatically set if exists in the above folder
SAngler Mask File: <file></file>	automatically set if exists in the above folder
Synthesized Image Folder: <folder></folder>	must be entered manually
Operation Mode:  Manual C Automatic Watch Interval 180 s Auto-Run Start	—
Image Data Information Table         Refresh         ← be sure to press after you have changed above entries         Run	← press to make synthesized images
No Driginal Image Shifted Image 1 Relative Position 1 Intensity Ratio 1 None Shifted Image 2	Relative Position 2 Intensity Ratio 2 None Synthesized Image

- 3.2 Tool Tips
  - a Tool tips are available for main widgets and may help you as reference.
  - b To show the tool tips, place the mouse cursor over them keeping it fixed for a moment.
  - c Tool Tips appear in yellow bubble boxes as in Fig. 3-2.

#### Fig. 3-2 Example of a tool tip of a folder selection button

O Detector Image Synthesizer 0.3.1 (2016-01-07 python 3.5.0 64bit)	
Options	
Setting Information Entries Clear press to clear the following entries	
Measured Image Folder: <folder></folder>	must be entered manually
Measurement Log File: <file></file>	Select an appropriate folder with this button.
SAngler Mask File: <	automatically set if exists in the above folder
Synthesized Image Folder: <folder></folder>	must be entered manually
Operation Mode:  Manual C Automatic Watch Interval 180 + s Auto-Run Start	_
Image Data Information Table Refresh	Run ← press to make synthesized images
No Original Image Shifted Image 1 Relative Position 1 Intensity Ratio 1 None Shifted Image 2	Prevention 2 Intensity Ratio 2 None Synthesized Image

<sup>&</sup>lt;sup>1</sup> "run.exe" runs a "Windows application" version of the tool which doesn't accompany any "command prompt" window. On the other hand, "run.bat" runs a "console application" version which does accompany a "command prompt" window for trouble shooting purpose.

- 3.3 Entering Setting Information
  - a As you see in the "Setting Information Entries" section of the main window, four entry inputs are required.
  - b You can enter the folders or files in any of the three ways, namely, by drag and dropping, or by pressing the selection button labeled as "…", or by typewriting directly into each entry box.
  - c On filling in the "Measured Image Folder" in any way, a dialog window shown below will appear which asks for permission to set the subsequent two file entries automatically.

Fig. 3-3 Dialog to ask permission for automatic insertion

O Quentio	on 🔀
?	Log and/or mask files exist in the folder. Insert the corresponding entries?
	(はい(Y) いいえ( <u>N</u> )

- d Reply "Y" if it is appropriate. If not, reply "N" to enter the files separately.
- e The window should look like the figure below after the setting of log/mask file entries.

Fig. 3-4 Main window after automatic setting of files

O Detector Image Synthesizer 0.3.1 (2016-01-07 python 3.5.0 64bit)	
Options	
Setting Information Entries Clear press to clear the following entries	
Measured Image Folder: F:/Development/TestData/PILATUS1M/AgBh_center	must be entered manually
Measurement Log File: F:/Development/TestData/PILATUS1M/AgBh_center/measurement_AgBh_center.log	automatically set if exists in the above folder
SAngler Mask File: F:/Development/TestData/PILATUS1M/AgBh_center/20151019cent01_0_00000.mask	automatically set if exists in the above folder
Synthesized Image Folder: <folder></folder>	must be entered manually
Operation Mode: C Manual C Automatic Watch Interval 180 - s Auto-Run Start	
Image Data Information Table         Refresh         ← be sure to press after you have changed above entries         Run	← press to make synthesized images
No Original Image Shifted Image 1 Relative Position 1 Intensity Ratio 1 None Shifted Image 2 R	Ielative Position 2 Intensity Ratio 2 None Synthesized Image

- f Enter "Synthesized Image Folder" as appropriate in the same way if one already exists.
- g In case you need to create a new folder, pressing the corresponding button labeled as "…" will help you by popping up a dialog<sup>2</sup> shown below, suggesting candidate locations of the folder.

 $<sup>^{2}\,</sup>$  This dialog pops up only when the entry box is empty.

## Fig. 3-5 Dialog suggesting candidate locations of the "Synthesized Image Folder"

Solder Creation Dialog	x
Select (and change if needed) one of the new folders suggested below to create.	
F:/Development/TestData/PILATUS1M/AgBh_center/Synthesized	
C F:/Development/TestData/PILATUS1M/AgBh_center-Synthesized	
C F:/Synthesized	_
If you cancel, the file selection dialog will follow.	
OK Cancel	

- h In case you want to cancel inputs, press the "Clear" button at top to clear all the four entries.
- i You can save the input values at the finishing of the tool. (See 3.6)
- 3.4 Manual Operation
  - a When you are finished with the above entries, the "Refresh" button suggesting text will start blinking to make you aware that the tool is ready for the next step.
  - b Press the "Refresh" button to get the current list of images available in the folder.
  - c The main window should look like the figure below after refresh.

#### Fig. 3-6 Main window after refresh

Detector Image Synthesizer 0.	.3.1 (2016-01-07 python	3.5.0 64bit)					
Options							
Setting Information Entries	Clear press to clear	the follwing entr	ies				
Measured Image Folder: F	:/Development/TestData	a/PILATUS1M/Ag	Bh_center		n	nust be entered man	ually
Measurement Log File: F	:/Development/TestData	a/PILATUS1M/Ag	Bh_center/measure	ement_AgBh_center.log	a	utomatically set if ex	ists in the above folder
SAngler Mask File: F	:/Development/TestData	a/PILATUS1M/Ag	Bh_center/2015101	9cent01_0_00000.mask	a	utomatically set if ex	ists in the above folder
Synthesized Image Folder: F	:/Development/TestData	a/PILATUS1M/Ag	Bh_center/Synthesi	ized	n	nust be entered man	ually
Operation Mode:	<ul> <li>Manual C Auton</li> </ul>	natic Watch I	nterval 180 🔺 s	Auto-Run Start			
Image Data Information Table	Refresh ← be sure	to press after yo	ou have changed ab	ove entries Run	← press to	make synthesized in	nages
No Original Image	Shifted Image 1	Relative Position 1	Intensity Ratio 1 None	Shifted Image 2	Relative Position 2	Intensity Ratio 2 None	Synthesized Image
1 AgBh002_0_00000.tif	AgBh002_1_00000.tif	5,3	1.00000	AgBh002_2_00000.tif	-5,-3	1.00000	
2 AgBh003_0_00000.tif	AgBh003_1_00000.tif	5,3	1.00000	AgBh003_2_00000.tif	-5,-3	1.00000	
3 AgBh004_0_00000.tif	AgBh004_1_00000.tif	5,3	1.00000	AgBh004_2_00000.tif	-5,-3	1.00000	
4 AgBh005_0_00000.tif	AgBh005_1_00000.tif	5,3	1.00000	AgBh005_2_00000.tif	-5,-3	1.00000	
5 AgBh006_0_00000.tif	AgBh006_1_00000.tif	5,3	1.00000	AgBh006_2_00000.tif	-5,-3	1.00000	
6 AgBh007_0_00000.tif	AgBh007_1_00000.tif	5,3	1.00000	AgBh007_2_00000.tif		1.00000	
7 AgBh008_0_0000.tif	AgBh008_1_00000.tif	5,3	1.00000	AgBh008_2_00000.tif	-5,-3	1.00000	

d Blue rows in the list, all rows in this case, suggest "selected" rows to synthesize.<sup>3</sup>

<sup>&</sup>lt;sup>3</sup> The tool memorizes the last row processed in the run so that only yet-to-be-processed images are selected after each refresh. Accordingly, the first refresh in the run always selects all the rows.

- e Press the "Run" button and reply "OK" to the confirmation dialog to make synthesized images from selected raw images.
- f The progress will be shown in a log window which should look like the figure below.

Excution Thread Log			×
Making 7 synthesized images from AgBh002 to A	AgBh008	*0	
	100%	6	
Operation has been finished successfully			
14:20:10       Synthesizing AgBh002_0_00000         14:20:10       Synthesizing AgBh002_1_syn         14:20:10       Synthesizing AgBh003_0_000000         14:20:10       Synthesizing AgBh003_1_syn         14:20:10       Synthesizing AgBh004_0_00000         14:20:10       Synthesizing AgBh004_0_00000         14:20:10       Synthesizing AgBh004_0_00000         14:20:11       Synthesizing AgBh005_0_00000         14:20:11       Synthesizing AgBh005_0_00000         14:20:11       Synthesizing AgBh005_0_00000         14:20:11       Synthesizing AgBh005_0_00000         14:20:11       Synthesizing AgBh006_1_syn         14:20:11       Synthesizing AgBh007_0_100000         14:20:11       Synthesizing AgBh007_1_syn         14:20:11       Synthesizing AgBh008_0_00000         14:20:11       Synthesizing AgBh008_1_syn         14:20:11       Synthesizing AgBh008_1_syn         14:20:11       Operating AgBh008_1_syn	and AgBh002_1_00000 and AgBh002_2_00000 and AgBh003_2_00000 and AgBh003_2_00000 and AgBh004_1_00000 and AgBh005_2_00000 and AgBh005_2_00000 and AgBh006_2_00000 and AgBh006_2_00000 and AgBh007_1_00000 and AgBh007_1_00000 and AgBh008_2_00000 and AgBh008_2_00000 and AgBh008_2_00000	into AgBh002_1_syn into AgBh003_syn into AgBh003_syn into AgBh004_1_syn into AgBh004_syn into AgBh005_syn into AgBh005_syn into AgBh006_syn into AgBh006_syn into AgBh007_1_syn into AgBh007_syn into AgBh008_syn into AgBh008_syn	
	ОК		

Fig. 3-7 Log window of the synthesizing process

- g The log shows stepwise progress, reporting two steps for each sample with triple images.
- h Intermediate results such as "AbBh002\_1\_syn" reported in the log are kept only in memory and not saved into external files unless you specify in the "Developer Options". (See 5.4)
- i Press "OK" in the log window when finished.
- j Synthesized file names with "\_syn" postfix are added to the rightmost column in the list.

#### Fig. 3-8 Main window after making synthesized images

O Detector Image Synthesizer 0.	.3.1 (2016-01-07 python	3.5.0 64bit)						
Options								
Setting Information Entries Clear press to clear the following entries								
Measured Image Folder: F	:/Development/TestData	/PILATUS1M/Ag	Bh_center		m	ust be entered m	nanually	
Measurement Log File: F	:/Development/TestData	/PILATUS1M/Ag	Bh_center/measure	ment_AgBh_center.log	au	tomatically set i	f exists in the above folder	
SAngler Mask File: F	:/Development/TestData	/PILATUS1M/Ag	Bh_center/2015101	9cent01_0_00000.mask	au	tomatically set i	f exists in the above folder	
Synthesized Image Folder:	:/Development/TestData	/PILATUS1M/Ag	Bh_center/Synthesi	zed	m	ust be entered m	nanually	
Operation Mode:	Manual C Auton	natic Watch I	nterval 180 🌲 s	Auto-Run Start				
Image Data Information Table	Refresh ← be sure	to press after yo	ou have changed ab	ove entries Run	← press to r	nake synthesized	d images	
No Original Image	Shifted Image 1	Relative Position 1	Intensity Ratio 1 None	Shifted Image 2	Relative Position 2	Intensity Ratio 2 No	ne Synthesized Image	
1 AgBh002_0_00000.tif	AgBh002_1_00000.tif	5,3	1.00000	AgBh002_2_00000.tif	-5,-3	1.00000	AgBh002_syn.tif	
2 AgBh003_0_00000.tif	AgBh003_1_00000.tif	5,3	1.00000	AgBh003_2_00000.tif	-5,-3	1.00000	AgBh003_syn.tif	
3 AgBh004_0_00000.tif	AgBh004_1_00000.tif	5,3	1.00000	AgBh004_2_00000.tif	-5,-3	1.00000	AgBh004_syn.tif	
4 AgBh005_0_00000.tif	AgBh005_1_00000.tif	5,3	1.00000	AgBh005_2_00000.tif	-5,-3	1.00000	AgBh005_syn.tif	
5 AgBh006_0_00000.tif	AgBh006_1_00000.tif	5,3	1.00000	AgBh006_2_00000.tif	-5,-3	1.00000	AgBh006_syn.tif	
6 AgBh007_0_00000.tif	AgBh007_1_00000.tif	5,3	1.00000	AgBh007_2_00000.tif	-5,-3	1.00000	AgBh007_syn.tif	
7 AgBh008_0_0000.tif	AgBh008_1_00000.tif	5,3	1.00000	AgBh008_2_00000.tif	-5,-3	1.00000	AgBh008_syn.tif	

- k Note that the blue selection has disappeared now, since no more rows remain to be synthesized.
- 1 At this point, synthesized images have been already saved into the output folder.
- m The log messages same as in the log window are saved in a file named as "synthesizerw.log" in the output folder.

						x		
COO VILATUS1M	•	AgBh_center > Synthesiz	ed 🗸 😽	Synthesizedの検索		٩		
ファイル(E) 編集(E) 表示(⊻) ツール(I) ヘルプ( <u>H</u> )								
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☆ お気に入り	^	名前	日付時刻	種類	サイズ	タグ		
🗥 SkyDrive	_	🛃 AgBh002_syn.tif	2016/01/08 11:59	TIFF イメージ	3,998 KB			
] ダウンロード	-	🛃 AgBh003_syn.tif	2016/01/08 11:59	TIFF イメージ	3,998 KB			
📃 デスクトップ		🛃 AgBh004_syn.tif	2016/01/08 11:59	TIFF イメージ	3,998 KB			
最近表示した場所		🛃 AgBh005_syn.tif	2016/01/08 11:59	TIFF イメージ	3,998 KB			
Synthesized?		🛃 AgBh006_syn.tif	2016/01/08 11:59	TIFF イメージ	3,998 KB			
Ju Synchesizedz		🛃 AgBh007_syn.tif	2016/01/08 11:59	TIFF イメージ	3,998 KB			
		🌌 AgBh008_syn.tif	2016/01/08 11:59	TIFF イメージ	3,998 KB			
🍃 ライブラリ		synthesizerw.log	2016/01/07 15:55	テキスト ドキュ	3 KB			
🚮 Git								
📑 ドキュメント	Ŧ	•				÷.		
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Fig. 3-9 Results in a "Synthesized Image Folder"

## 3.5 Automatic Operation

- a You can repeat automatically the "Refresh and Run" cycle in regular intervals.
- b The automatic control is considered to be useful when used in parallel along with the measurement operations.
- c You can switch to the "Automatic" mode by changing the "Operation Mode" radio button selection from "Manual" to "Automatic".



🔘 Detector Image Synthesizer 0.3.1 (2016-01-07 python 3.5.0 64bit)							
Options							
Setting Information Entries Clear press to clear the following entries							
Measured Image Folder: F	Measured Image Folder: F:/Development/TestData/PILATUS1M/AgBh_center must be entered manually					nually	
Measurement Log File: F:/Development/TestData/PILATUS1M/AgBh_center/measurement_AgBh_center.log automatically set if exists in the above for					xists in the above folder		
SAngler Mask File: F:/Development/TestData/PILATUS1M/AgBh_center/20151019cent01_0_00000.mask automatically set if exists in the above fold					xists in the above folder		
Synthesized Image Folder: F:/Development/TestData/PILATUS1M/AgBh_center/Synthesized must be entered manually					nually		
Operation Mode: C Manual C Automatic Watch Interval 180 s Auto-Run Start							
Image Data Information Table	Refresh R	un					
No Original Image	Shifted Image 1	Relative Position 1	Intensity Ratio 1 None	Shifted Image 2	Relative Position 2	Intensity Ratio 2 None	Synthesized Image
1 AgBh002_0_00000.tif	AgBh002_1_00000.tif	5,3	1.00000	AgBh002_2_00000.tif	-5,-3	1.00000	AgBh002_syn.tif
2 AgBh003_0_00000.tif	AgBh003_1_00000.tif	5,3	1.00000	AgBh003_2_00000.tif	-5,-3	1.00000	AgBh003_syn.tif
3 AgBh004_0_0000.tif	AgBh004_1_00000.tif	5,3	1.00000	AgBh004_2_00000.tif	-5,-3	1.00000	AgBh004_syn.tif
4 AgBh005_0_00000.tif	AgBh005_1_00000.tif	5,3	1.00000	AgBh005_2_00000.tif	-5,-3	1.00000	AgBh005_syn.tif
5 AgBh006_0_00000.tif	AgBh006_1_00000.tif	5,3	1.00000	AgBh006_2_00000.tif	-5,-3	1.00000	AgBh006_syn.tif
6 AgBh007_0_00000.tif	AgBh007_1_00000.tif	5,3	1.00000	AgBh007_2_00000.tif	-5,-3	1.00000	AgBh007_syn.tif
7 AgBh008_0_0000.tif	AgBh008_1_00000.tif	5,3	1.00000	AgBh008_2_00000.tif	-5,-3	1.00000	AgBh008_syn.tif

- d The default watch interval is set to 180 seconds. Change it with the spin button if it is not appropriate.
- e Press "Auto-Run Start" button to start the automatic control of the "Refresh and Run" cycles.
- f The log window in the automatic operation mode is shown in the figure below.

Fig. 3-11 Log window in the automatic operation mode

O Auto Run Thread Log	X
Controlling syntheses	
	Time left until next Refresh: 158
Task is in progress	
13:03:00         Synthesizing         Agghuot_1         Synthesizing         Agghuot_0         D00000           13:59:39         Synthesizing         Agghuot_1         syn           13:59:39         Synthesizing         Agghuot_1         syn           13:59:39         Synthesizing         Agghuot_1         syn           13:59:39         Synthesizing         Agghuot_1         syn           13:59:39         Synthesizing         Agghuot_0         00000           13:59:39         Synthesizing         Agghuot_1         syn           13:59:39         Synthesizing         Agghuot_1         syn	and Agbnous 2 00000       Into Agbnous Syn         and AgBh0041_00000       into AgBh0041_syn         and AgBh0052_00000       into AgBh005_syn         and AgBh0051_00000       into AgBh0061_syn         and AgBh0052_00000       into AgBh0061_syn         and AgBh0062_00000       into AgBh0061_syn         and AgBh0061_00000       into AgBh0065_syn         and AgBh0062_00000       into AgBh0065_syn         and AgBh0072_00000       into AgBh0061_syn         and AgBh0072_00000       into AgBh008_syn         and AgBh0081_00000       into AgBh008_syn         and AgBh0092_00000       into AgBh008_syn         and AgBh009_200000       into AgBh008_syn         and AgBh009_200000       into AgBh008_syn         and AgBh009_200000       into AgBh008_syn         and AgBh009_200000       into AgBh008_syn         and AgBh001_100000       into AgBh00_syn         and AgBh010_200000       into AgBh010_syn         and AgBh011_1_00000       into AgBh01_syn         and AgBh011_son       into AgBh01_syn
	Cancel

- g The progress bar shows the time left until the next refresh.
- $h \quad \ \ {\rm Press\ the\ ``Cancel''\ button\ to\ stop\ the\ automatic\ control.}$

## 3.6 Finishing the Tool

- a You can finish the tool by clicking "X" button at the upper right corner of the main window.
- $b \quad Answer to the input information handling question dialog^4 \ if you have changed any of them.$

## Fig. 3-12 Setting information handling question dialog

Entry Data Handling Question	3
Do you want to save the folder/file entries?	
(はい(Y) いいえ( <u>N</u> )	

 $<sup>^4\,</sup>$  This dialog appears only if the handling policy is set to "Ask". See 5.2.

## 4 Visual Checking of the Images

a You can double click a row in the "Image Data Information Table" to view the images visually as shown below.



## Fig. 4-1 Images shown for visual checking

- b For detailed inspection, following features are available.
  - Pixel coordinates and intensities corresponding to mouse cursor are shown at the lower right corner of the canvas.
  - Use mouse wheel to zoom in/out.
  - Drag mouse cursor to move the images.
  - Clicking with <shift> key down shows pixel annotations (see Fig. 4-2); press <escape> key to hide them. You can move the annotations, pixel by pixel, using arrow keys.
  - Mouse wheel with <ctrl> key down changes color map function gradually.
- c Retry the synthesizing operation if you find any flaws. See "Advanced Operations" sections for retry operations.



#### Fig. 4-2 Pixel annotations shown for detailed inspection

## 5 Advanced or Less Frequently Used Operations

- 5.1 Partial Operation
  - a In the manual operation mode, you can select an arbitrary subset of the rows in the "Image Data Information Table" and (re)do synthesizing.
  - b Such partial selection can be attained by one of the following ways:
    - clicking a single row
    - dragging over or <shift>-clicking consecutive multiple rows
    - <ctrl>-clicking non-consecutive rows
    - clicking the **No** title at the upper left corner of the table which selects all rows

## Fig. 5-1 Selection of a subset of rows and the popup action menu



- c For the selected subset, you can select an action from the action menu invoked by rightclicking the mouse button.
- d Available actions are listed in Tab. 5-1 below.

Tab. 5-1 Available actions in the action menu

Action Name	Description		
Show Original Images	Shows detector output raw images and a synthesized image.		
Show Adjusted Images	Same as above except showing adjusted images for shifted ones.		
Make Synthesized Images	Makes synthesized images. Same action as pressing the "Run" button.		
Execute with Temporary	See 5.3.		
Preference Changes			
Tiff File Description	Shows the description text attached to the tiff file.		

## 5.2 Preference Changes

- a Users can change some of the modes in which the tool operates in the dialog shown below, which is invoked by clicking [Options] / [Preferences] in the menu.
- b Changes in this dialog are valid until the next changes by this dialog.

		×
<ul> <li>Just Cover</li> </ul>	C Compute Average	
None 👻		
_syn		
ALBULA Like	O Diverging	
Ask	C Save	C No Save
ок	Cancel	
	<ul> <li>⑦ Just Cover</li> <li>None ▼</li> <li>_syn</li> <li>③ ALBULA Like</li> <li>④ Ask</li> <li>OK</li> </ul>	<ul> <li>ⓒ Just Cover</li> <li>○ Compute Average</li> <li>None</li> <li>_syn</li> <li>ⓒ ALBULA Like</li> <li>○ Diverging</li> <li>ⓒ Ask</li> <li>○ Save</li> <li>OK</li> <li>Cancel</li> </ul>

## Fig. 5-2 Usual Preferences Dialog

c For "Synthesizing Method", select one from the following table.

Tab. 5-2 Available Synthesizing Methods

Method Name	Description
Just Cover	replaces missing pixel values of the base image by corresponding valid pixel
	values of the shifted image (default)
Compute Average	compute averages of the corresponding valid pixel values of the measured
	images

- d "Beam Intensity Counter" can be used to normalize the values, in cases when the beam intensity variation among the measurements seems significant, using one of the valid intensity counters shown in this combo box. Selecting "None" here, which is default, means applying no normalization.
- e The value you put in the "Synthesized File Postfix" is appended to the output file names as specified.
- f "Color Mapping Scheme" can be selected among the two. Try and see the difference.
- g If "Ask" is selected, the tool pops up the question dialog at the closing of the tool (See 3.6).Otherwise, select "Save" or "No Save" if the preference is constant.

## 5.3 Temporary Preference Changes

- a The dialog shown below appears when you select one of the "Execute with Temporary Preference Changes" actions in the cascaded submenu.
- b Changes in this dialog are valid only during this execution on the selected rows.

## Fig. 5-3 Temporary Preferences Dialog

Temporary Preferences				×
Sythesizing Method:	Just Cover	C Compute Average		
Beam Intensity Counter:	None -			
Synthesized File Postfix:	_syn			
Image Files to Synthesize:	<ul> <li>All</li> </ul>			
	$\bigcirc$ Select $\Rightarrow$	▼ *_0_*,tif	🔽 *_1_*.tif	▼ *_2_*.tif
		OK Cancel		

- c Select "Image Files to Synthesize" by the check buttons if you do not want to use all the shifted images.
- d See the previous section for the description of other items.

## 5.4 Developer Options

- a Users are not supposed to change "Developer Options".
- b The dialog shown below is invoked by clicking [Options] / [Developer Options] in the menu.

## Fig. 5-4 Developer Options Dialog

O Developer Options				x
Adjust Algorithm:	Round	○ Fast	C Slow	
Acceptable Pixel Cover Ratio:	0.5	-		
Adjusted File Output:	O Yes	No		
Adjusted File Postfix:	_adj	-		
Write Intermediate Results :	O Yes	No		
	ОК	Cancel		