GI ステージの手順書 2020.04.21 ユーザー向け

1. 試料の位置と角度の調整

・ステージの回転方向は以下の写真の通りです。BL-10C 及び BL-15A2 の GI ステージは、Pih 軸のモーターが BL-11 又は BL-16 側になります。また、BL-10C 及び BL-15A2 の GI ステージ は、0°~±45°の範囲(-45°~45°)で使用してください。ソフトリミットは-45°と45°に設定 されています。



BL-6A

BL-10C 及び BL-15A2

・実験開始時に、最初の試料でレーザーを使って GI ステージのおおよその位置を合わせておきます。



・PILARUS Measurement Control Software の Option から、Automatic GI sample alignment を選 択してください。

File Option Detector ● PILATUS 1 ● PILATUS 1 and 2 Directory ZWserWtest ● Directory ZWserWtest ● File prefix test001 File type @ tif ● tif Monochrometer Energy ● Wavelength Outro Output ● Individual ● Internal No, images 5 ● Exp. period [sec] 5.01 Exp. period [sec] 5.01 Exp. period [sec] 5.01 Exp. period [sec] 0.011 A (Exp. Delay) B [Exp. period] - [Exp. time] No. images 5.36 Stage control No. cycle I ● Cycle interval [sec] 0.011 + A + B + 0 ● Detector position ● Fix Pos. 1 Veiligner mode External enable mode ● Internal mode Single trigger mode Multi trigger mode External enable mode External enable mode	PILATUS Measu	surement Control Software at Photon Factory		_ 0 ×
Detector PILATUS 1 PILATUS 2 PILATUS 1 PILATUS 1	File Option	,		
Pliatus 1 Image: Source Source Stage control Image: Source Stage control Image: Source Stage control Image: Stat wait [sec] Image: Stat wait [sec] Image: Stat wait [sec] Image: State control Image: State	Detector	PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control 🔹	Energy Information
Internal mode Single trigger mode Multi trigger mode External enable mode Pilatus 2	Pilatus 1 Directory File prefix Monochrometer control No, images Exp. time [sec] Exp. delay [sec] Start wait [sec] No, cycle Detector position @ Auto Manu	Z#user¥test Image: Constraint of the state of the	Optional Settings Plot environment profiles to 1 file. Counter Output Individual Shutter Burst Mode ON Ø OFF	Enerzy (eV) 8266 Gain autos Energy update
Directory ZV File prefix File type I tif C cbf No, images Exp. time [sec] Exp. time [sec] Exp. teriod [sec] Exp. delay [sec] A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle Cycle interval [sec] IN c. cycle Cycle interval [sec] Image: Internal mode Single trigger mode Run Stop	Internal mode Pilatus 2 Directory File prefix No, images Exp. time [sec] Exp. time [sec] Exp. delay [sec] Start wait [sec] No, cycle ④ Internal mode (ZV Image: mode Extended in the priority of the prioretaneous of the prioretaneous of the priority		

・Automatic GI sample alignment が起動します。 Option→GI stage alignment configuration を選 択してください。

🖳 Automatic GI sample stage alignment						
Option						
Sample	stage					
	Present	Absolute	Relative			
ThetaY	Er: GI.ThetaY deg	Go	Go			
Ver	0.21000 mm	Go	Go			
Automa	ntic GI sample sta	age alignment				
	Start	Stop				
Info			*			
			-			
Click [x] but	tton to close this wind	ow.	.::			

・GI stage alignment configuration が起動します。

・B.S.のビームを調整する際の PD の Ver.が空欄でしたら、入力してください。通常はセッティングの担当者が入れています。

🖳 GI stage alignment configuration							
PD Reset Beam Stopper (Absolute) Ver 9.482 mm Sample stage							
Ver ThetaY By use of channel CH4 • By use of channel CH4 •							
Mode 🔿 ABS 💿 REL 🛛 Mode 🔿 ABS 💿 REL							
Start (mm)	1		Start (mm)	0.8			
End (mm)	-1		End (mm)	-0.8			
Step (mm)	0.05		Step (mm)	0.02			
Integ (sec)	0.1		Integ (sec)	0.1			
Final position			Final position				
1st move to	1st move to Differential peak						
2nd move to Original position							
Update Close							
Input Ok. No changed value.							

・Ver では次のように指定します。By use of channel は CH4。Mode は REL。Start は 1、End は-1、Step は 0.05、Integ は 0.1 を入れてください。Final position は、1stを Differential peak、2nd を Original position としてください。

・ThetaY でも次のように指定します。By use of channel は CH4。Mode は REL。Start は 0.8、End は-0.8、Step は 0.02、Integ は 0.1 を入れてください。Move to Peak を選択します。

🖳 GI stage aligi	nment configura	tion					
PD Reset Beam Stopper (Absolute) Ver 9.482 mm Sample stage							
Ver By use of channel CH4 - By use of channel CH4 -							
Mode 🔘 ABS 💿 REL 🛛 Mode 🔘 ABS 💿 REL							
Start (mm)	1		Start (mm)	0.8			
End (mm)	-1		End (mm)	-0.8			
Step (mm)	0.05		Step (mm)	0.02			
Integ (sec)	0.1		Integ (sec)	0.1			
Final position			Final position				
1st move to	Differentioal peak		Move to Pe	ak			
2nd move to	Original position		🔘 Move to Gr	avity 🔶			
Update Close							
Input Ok. No changed value.							

・Updateを押してください。

🖳 GI stage alignment configuration							
PD Reset Beam Stopper (Absolute) Ver 9.482 mm Sample stage							
Ver ThetaY By use of channel CH4 Ver By use							
Mode 🔘 ABS 💿 REL 🛛 Mode 🔘 ABS 💿 REL							
Start (mm)	1		Start (mm)	0.8			
End (mm)	-1		End (mm)	-0.8			
Step (mm)	0.05		Step (mm)	0.02			
Integ (sec)	0.1		Integ (sec)	0.1			
Final position			Final position				
1st move to	Differentioal peak	_	Move to Pe	ak			
2nd move to Original position							
Update Close							
Input Ok. No changed value.							

・Automatic GI sample alignment の Start を押してください。PD が X 線の位置まで移動してきま す。続いて、Ver の調整、ThetaY の調整、Ver の調整が自動的に行われます。

🖳 Automati	ic GI sample stage ali <u>c</u>	Inment	
Option			
Sample	stage		
	Present	Absolute	Relative
ThetaY	Er: GI.ThetaY deg	Go	Go
Ver	0.21000 mm	Go	Go
Automa	tic GI sample sta	age alignment	
	Start	Stop	
Info			*
			Ψ.
Click [x] but	ton to close this windo	ow.	.:

・自動調整終了後に、Verの変曲点の値をVerのRelativeに入力してGoを押してください。ユ ーザーさんの希望でこのようになりました。

🖳 Autom	atic GI sample stage ali <u>c</u>	gnment	
Option			
Samp	le stage		
	Present	Absolute	Relative
Theta	Y Er: GI.ThetaY deg	Go	Go
Ver	0.21000 mm	Go	Go
Auton	natic GI sample sta	age alignment	
	Start	Stop]
Info			*
			-
	where he also a hits with d		
Click [x] b	outton to close this wind	ow.	

・以後、Automatic GI Sample stage alignment の stat を押して調整をすることができます。自動調整終了後に Ver の変曲点の値を Ver の Relative に入力して Go を押します。GI stage alignment configuration の Ver と ThetaY の値は変更していただいても構いません。

2. ThetaY を変えながらの測定

・PILATUS Measurement Control Software at Photon Factory で「Stage Control」をクリックしてください。

📴 PILATUS Measure	ment Control Software at Photon Factory		
File Option			
Detector	PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information
Pilatus 1 Directory File prefix No, images Exp. time [sec]	Z¥user¥test¥20170913 test001 File type tif C cbf	Optional Settings Plot environment profiles to 1 file. Counter Output Individual Shutter Burst Mode ON	Gain autog
Exp. period [sec] Exp. delay [sec] Start wait [sec] No. cycle	5.1 0 A: [Exp. Delay] B: [Exp. period] - [Exp. time 10 ⊕ Cycle interval [sec] 0.001 + A + B + 0		
Detector position	Fix Change Relative to Current Pos. 1 Ver 0 Hor 0 Pos. 2 Ver 0 Hor 0 Single trigger mode Multi trigger mode External enable mode		
Pilatus 2 Directory File prefix No, images	Z¥ File type () tif () cbf		
Exp. time [sec] Exp. period [sec] Exp. delay [sec] Start wait [sec] No. cycle	A: [Exp. Delay] B: [Exp. period] - [Exp. time 1 Cycle interval [sec] 0.001 + A + B + 0		
Internal mode	Single trigger mode 🔵 Multi trigger mode 🌀 External enable mod		
	Run Stop		
Ready to start.			

・Select Stage type で「Use gi thetay scan」を選択します。以下の画面は-0.1°から-1°まで 0.1°ごとにスキャンする例です。OK で閉じます。

	Stage control					Date for the	-		
[Select stage type GI thetaY scan Please input the abs	O Unuse s Use rota Use sam Use si th Use si th solute value	tages ry sample cl ole stage sc netay scan : to each p	hanger anning Dosition.					
			Start.	End.	Step count.	per step.			
	GI thetaY	deg	-0.1	-1	10	-0.1			
	Number of cycles 10								
			Ok			Cancel			
]	nput ok. 'Stage control	' enabled. Cli	ck 'Ok' if ch	ange the v	values.				.:

・Runを押して測定を開始します。

📴 PILATUS Measur	ement Control Software at Photon Factory		
File Option			
Detector	PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control	Energy Information
Detector Pilatus 1 Directory File prefix No. images Exp. time [sec] Exp. period [sec] Exp. delay [sec] Start wait [sec] No. cycle Detector position Image: Auto Internal mode	PILATUS 1 PILATUS 1 and 2 Z¥user¥test#20170913 test001 File type tif cbf 5 5 5 5 5 6 7	Control program mode Pilatus with shutter control Optional Settings Plot environment profiles to 1 file. Counter Output Individual Integration Shutter Burst Mode ON	Energy Information Energy (eV) 8266 * Gain autog Energy update
Pilatus 2 Directory File prefix No, images Exp. time [sec] Exp. dely [sec] Start wait [sec] No. cycle Internal mode C Ready to stark.	Z¥ File type I A: [Exp. Delay] B: [Exp. period] - [Exp. time] A: [Exp. Delay] B: [Exp. period] - [Exp. time] Oycle interval [sec] 0.001 + A + B + 0 Single trigger mode Multi trigger mode Exp. Single trigger Stop		

・出力されるファイル名は上記の場合、test001_0(サイクル)_00000(測定枚数).tifとなります。

3. GI ステージのスキャンの段階的な変更

・GIステージのスキャンを段階的に変更できます。

・PILARUS Measurement Control Software の Stage control を押してください。

File Option Detector PLATUS 1 PLATUS 1	PILATUS Measurement Control Software at Photon Factory		
Detector Platus 1 Platus and 2 Control program mode Platus with shutter control File prefix Test value Platus 1 Control program mode Platus with shutter control File prefix Test value Platus 1 Control program mode Platus with shutter control File prefix Test value Platus vita shutter control File prefix Test value Platus vita shutter control File prefix Test value Platus vita shutter control File prefix Fil	File Option		
Platue 1 Optional Settings Optional Settings Optional Settings Directory ZWareNitest Optional Settings Optional Settings Outot to Uput Is binitiation Interation Optional Settings No. mages S S S S Exp. the [sec] 5.01 Exp. period = S.01 S S No. mages S S S S S S Start wait [sec] 0.01 A [Exp. Delay] B [Exp. period] - [Exp. time] No. cycle No. cycle Not No O FF Detector position File prefix Not note Notice Settings S S Optional Settings No. cycle No. tycle	Detector O PILATUS 1 O PILATUS 1 and 2	Control program mode Pilatus with shutter control -	Energy Information
Ready to start.	Detector PILATUS 1 PILATUS 1 and 2 Pliatus 1 Directory Z4user4test File prefix test001 File type @ tif @ cbf Monochrometer Energy @ Wavelength control 1.5 Å auto tune No, images 5 • • Exp. time [sec] 5 • • Start wait [sec] 0.01 A: [Exp. Delay] B: [Exp. period] - [Exp. time] No. cycle • Ocycle interval [sec] 0.01 + A + P + • Detector position Fix Change Stage control Auto Relative to Current Stage control Stage control Auto Relative to Current Brectory Stage control Relative to Current Manual Pos. 1 Ver Hor Pos. 2 Ver Hor Directory	Control program mode Pilatus with shutter control	Energy Information Energy (eV) 8266 Gain autog Energy update
	Ready to start.		

・Use custom scan を選択してください。

🖳 Stage contro	bl						
Select stage ty	ype O Unuse stages Use rotary san Use sample str Use gi thetay s Use custom so	nple char age scani scan san	nger ning				
Please inpu	ut the stagename and ab	solute	value to e	ach positie	on.		
Stepscan i	nput:		Start.	End.	per Step	Count.	
🔽 Pos. 1	GI_ThetaY 🔹	deg	-0.131	-0.231	-0.050	3	
V Pos. 2	GI_ThetaY •	deg	-0.232	-0.332	-0.020	6	
🔽 Pos. 3	GI_ThetaY •	deg	-0.337	-0.437	-0.100	2	
				Numb	per of cycle:	s 11	
Quickscan	input:		Start.	End.	per Step	Div.	
🔲 Pos. 1	<please select=""> *</please>]				-	
				Numt	ber of image	s –	
		Ok			Cancel		
Input ok. 'Stage	e control' enabled. Click 'Ok	if chan	ge the valu	es.			

・上記の例では、ThetaYを3段階に変化させてスキャンすることができます。

4. 併進機能とあわせた測定

- ・検出器を併進させる場合は、2. ThetaY を変えながらの測定又は 3.GI ステージのスキャンの段階的な変更に引き続き以下の操作を行います。
- ・Detector position から change を選択して、さらに Auto か Manual を選択してください。Manual を選択した際は、Pos.1 及び 2 の Ver.と Hor.を入力してください。

📴 PILATUS Measure	ement Contro	ol Software at Photon Fact	ory		-	-	– – X
File Option							
Detector	PILATUS 1 O PILATUS 1 and 2			Control program mode	Pilatus with shutter control		Energy Information
Pilatus 1				Optional Settings			Gain autog
Directory	Z¥user¥test¥20170913			Plot environment profiles to 1 file.			
File prefix	testUU1	File type 🥥 tif	🔘 cbf	Counter Output	Individual	 Integration 	Energy update
Exp. time [sec]	5			Shutter Burst Mode	O ON	O UFF	
Exp. period [sec]	5.1						
Exp. delay [sec]							
Start wait [sec]	0	A: [Exp. Delay] B: [Exp.period] - [Exp.time]				
No. cycle	10 🚖	Cycle interval [sec]	0.001 + A + B + 0				
Detector position	🔘 Fix	Ohang	Stage control				
💿 Auto	🗖 Pos. 1	Ver 0 Hor 0					
	Pos. 2	Ver 0 Hor 0					
Internal mode	Single trigger	mode 🔘 Multi trigger mode	External enable mode				
Dilature Q							
Directory	Z:¥						
File prefix		File type) tif	🔘 cbf				
No, images	1						
Exp. time [sec]							
Exp. period [sec]							
Start wait [sec]		A: [Exp. Delav] B: [Exp. period] - [Exp. time]				
No. cycle	1	Cycle interval [sec]	0.001 + A + B + 0				
) 🕘 Internal mode 🔘	Single trigger	mode 🔘 Multi trigger mode	 External enable mode 				
	Run	Stop					
Ready to start.							.:

・Runを押して測定を開始します。

・ファイル名は「test001_0(サイクル)_d0(併進位置)_00000(測定枚数).tif」となります。

5. 途中で動かなくなった場合

・測定 PC(MEAS PC)と制御 PC(CONT PC)上の Manager を一度終了してください。

manager(STARS device manager)	23
Load Cache#m2701drv:ch04.DCV.Range#AUTO#	
Load Cache#m2701drv:ch03.DCV.AverageState#1#	
Load Cache#m2701drv:DMM.TriggerDelay#0.01#	
Load Cache#m2701drv:DMM.DCV.Range#AUTO#	
Load Cache#m2701drv:ch01.DCV.Range#AUTO#	
Load Cache#m2701drv:DMM.DCV.AverageCount#5#	
Load Cache#m2701drv:ch01.DCV.AverageState#1#	
Load Cache#m2701drv:ch05.DCV.AverageState#1#	
Load Cache#m2701drv:ch02.DCV.AverageCount#5#	
Load Cache#m2701drv:ch04.DCV.NPLCycles#1#	
Load Cache#m2701drv:ch03.DCV.Range#AUTO#	
Load Cache#m2701drv:ch04.DCV.AverageState#1#	
Load Cache#m2701drv:ch03.DCV.AverageCount#5#	
Load Cache#m2701drv:ch02.DCV.NPLCycles#1#	
Load Cache#m2701drv:DMM.DCV.NPLCycles#1#	
Load Cache#m2701drv:ch05.DCV.Range#AUTO#	
Load Cache#m2701drv:ch02.DCV.AverageState#1#	
Load Cache#m2701drv:ch01.DCV.AverageCount#5#	
Load Cache#m2701drv:ch02.DCV.Range#AUTO#	
Load Cache#m2701drv:DMM.DCV.AverageState#1#	
Load Cache#m2701drv:ch03.DCV.NPLCycles#1#	
Load Cache#m2701drv:ch05.DCV.AverageCount#5#	
Load Cache#m2/01drv:ch01.DCV.NPLCycles#1#	=
Load Cache#m2701drv:DMM.DCV.AverageControl#REP#	
	*

👸 PILATUS Manager	
[2018-03-08 09:51:02,415][starsbridge] stbr.System>System _alive	^
[2018-03-08_09:51:02,415][starsbridge] stbrpilatus.System>System_alive	
2018-03-08 09:51:04.0240/3 Exited camstarsZ.	
2018-03-08 09:51:04.044671 Started camstarsZ.	
Socket: Unknown error	
[2018-03-08 09:51:07,875][starsbridge] stbr.5ystem/System_alive	
[2018-05-08 08:01:07,879]Estarsbridgej storpilatus.system/system_alive	
[2016-05-06 09:51:13,335][starsbridge] stbr.system/system_arrive	
[2018-03-06 09.51.18,555][Starsbridge] storpriatus.system/system_arive	
[2018-03-08 09:51:18 795][starsbridge] stbr.bystem/bystem/system_alive	
[2018-03-08 09:51:24 211][starsbridge] stbrpHatus.oystem_alive	
[2018-03-08 09:51:24,211][starsbridge] stbrojstem bystem _alive	
[2018-03-08 09:51:29.622][starsbridge] stbr.Svstem>System_alive	
[2018-03-08 09:51:29.622][starsbridge] stbrpilatus.System_System_alive	
2018-03-08 09:51:34.078593 Exited camstars2.	
2018-03-08 09:51:34.099198 Started camstars2.	
[2018-03-08 09:51:35,082][starsbridge] stbr.System>System _alive	
[2018-03-08 09:51:35,082][starsbridge] stbrpilatus.System>System _alive	
Socket: Unknown error	
[2018-03-08 09:51:40,542][starsbridge] stbr.System>System _alive	
[2018-03-08 09:51:40,542][starsbridge] stbrpilatus.System>System_alive	
[2018-03-08 09:51:46,002][starsbridge] stbr.System>System _alive	=
[2018-03-08 09:51:46,002][starsbridge] stbrpilatus.System>System_alive	

・測定 PC(MEAS PC)と制御 PC(CONT PC)上の Manager を起動してください。



BL-6 の場合

・制御 PC(CONT PC)上で、実際に GI ステージの軸を GUI から動かしてみてください。

🛃 BL-6A Stage Controller										
Option Se	etting									
	Present (mm) Absolute			Relative Scan tool						
Pinhole	Ver	-0.39900	Go	Go	Select Axis Sample.Ver	Present	0.79300	mm		
Stage	Hor	0.43350	Go	Go	Mode CABS CREL	Start	2.5	mm		
Sample	Ver	0.79300	Go	Go	Plot	End	-2.5	mm		
Stage	Hor	0.34300	Go	Go	C Standard	Step	0.1	mm		
Beam	Ver	2.01950	Go	Go	C Move to Peak	Integ	0.2	(sec)		
Stopper	Hor	1.07650	Go	Go	 Move to Gravity Move to center of FWHM 					
	Vor	-42 30000 -	Go		• Differential					
Detector	Hor	-1.00000	Go	Go	By use of channel CH4 💌					
		- 400 F			File Prefix					
GI	Theta Y	0.129	Go	Go	Comment					
	Phi	0.00000	Go	Go	Stop					
Bot	Presen	rt (pls)								
Sampler	RotX	Standby 🛛	0 Go	Go						
				Stop						
CH1: 366	408, CH2	2: 125, CH3:	U, CH4: 123, CH	15: U, CH6: 0, CH7:	U, CH8: U		Ge	t		
								.:		

・それでも動かないならば、6A 用ステージの場合はドライバの電源、10C/15A2 用ステージの場合は、パルスモータコントローラ SC410 の電源を落として、30 秒待って再度電源を入れてください。

