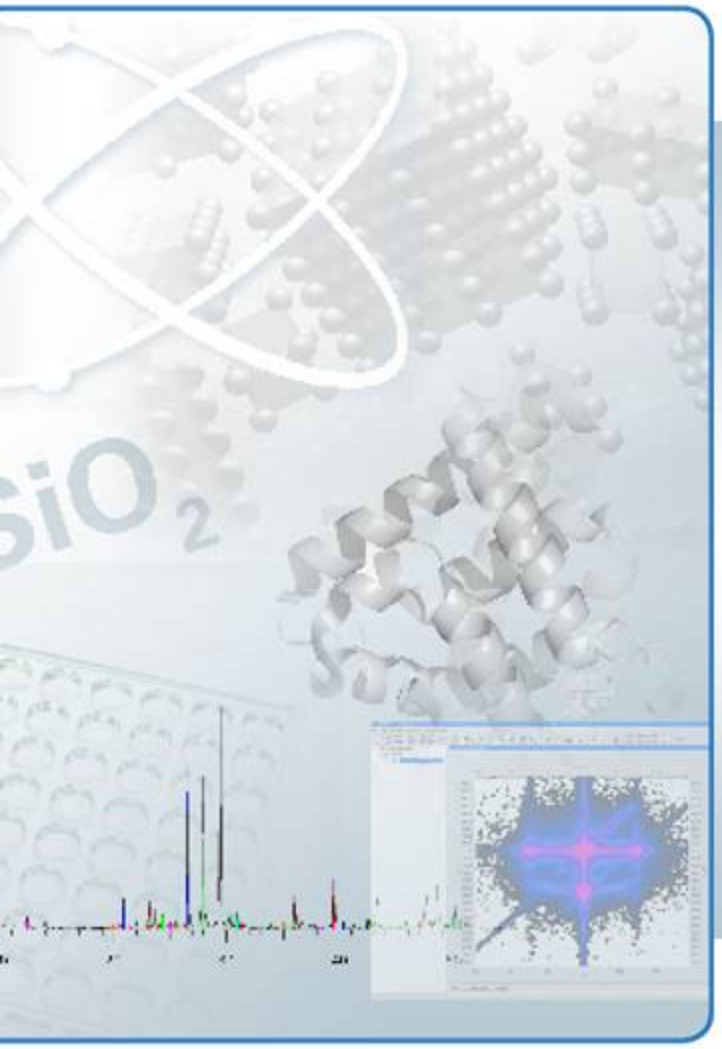
NANOSTAR Operation Manual



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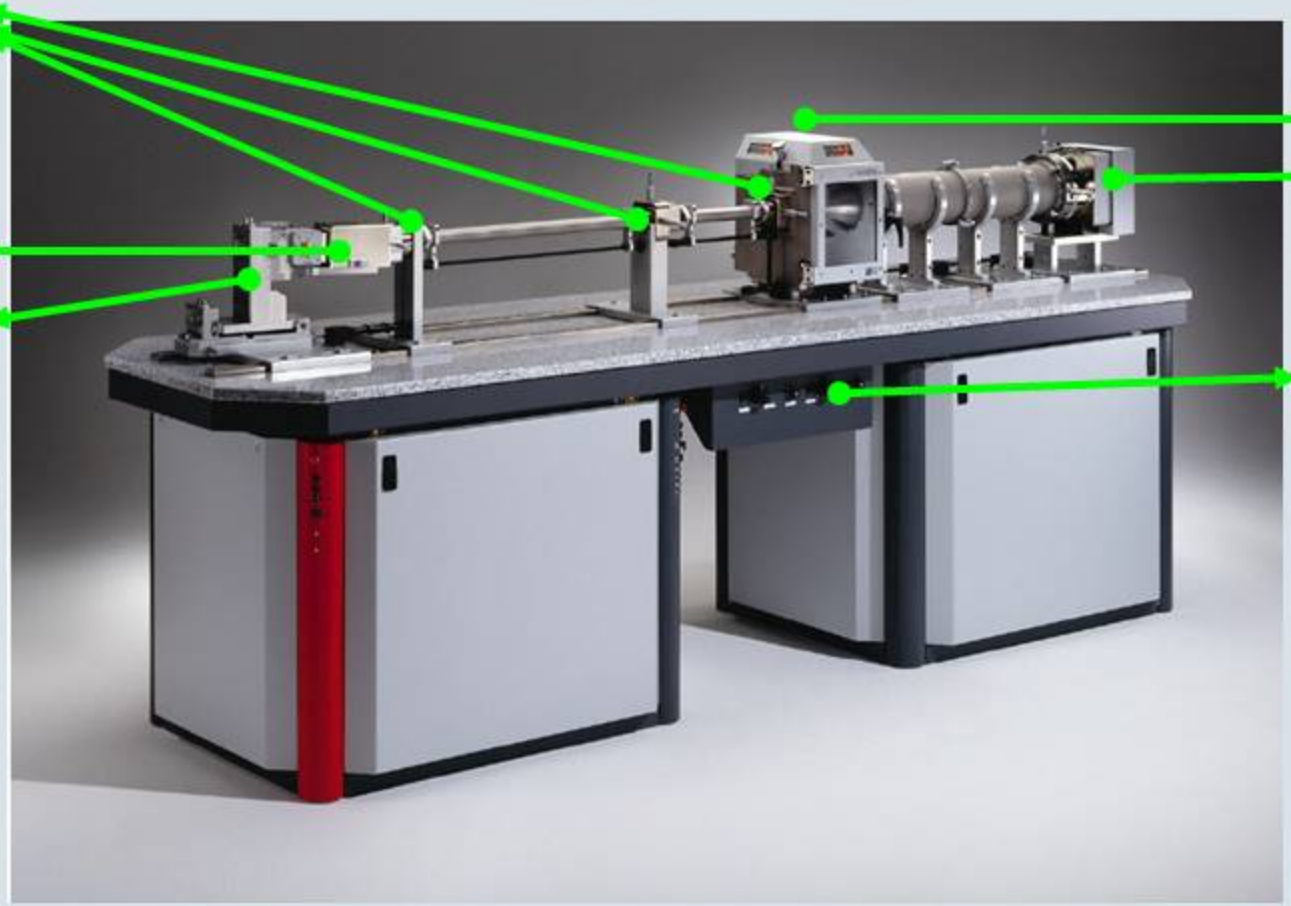
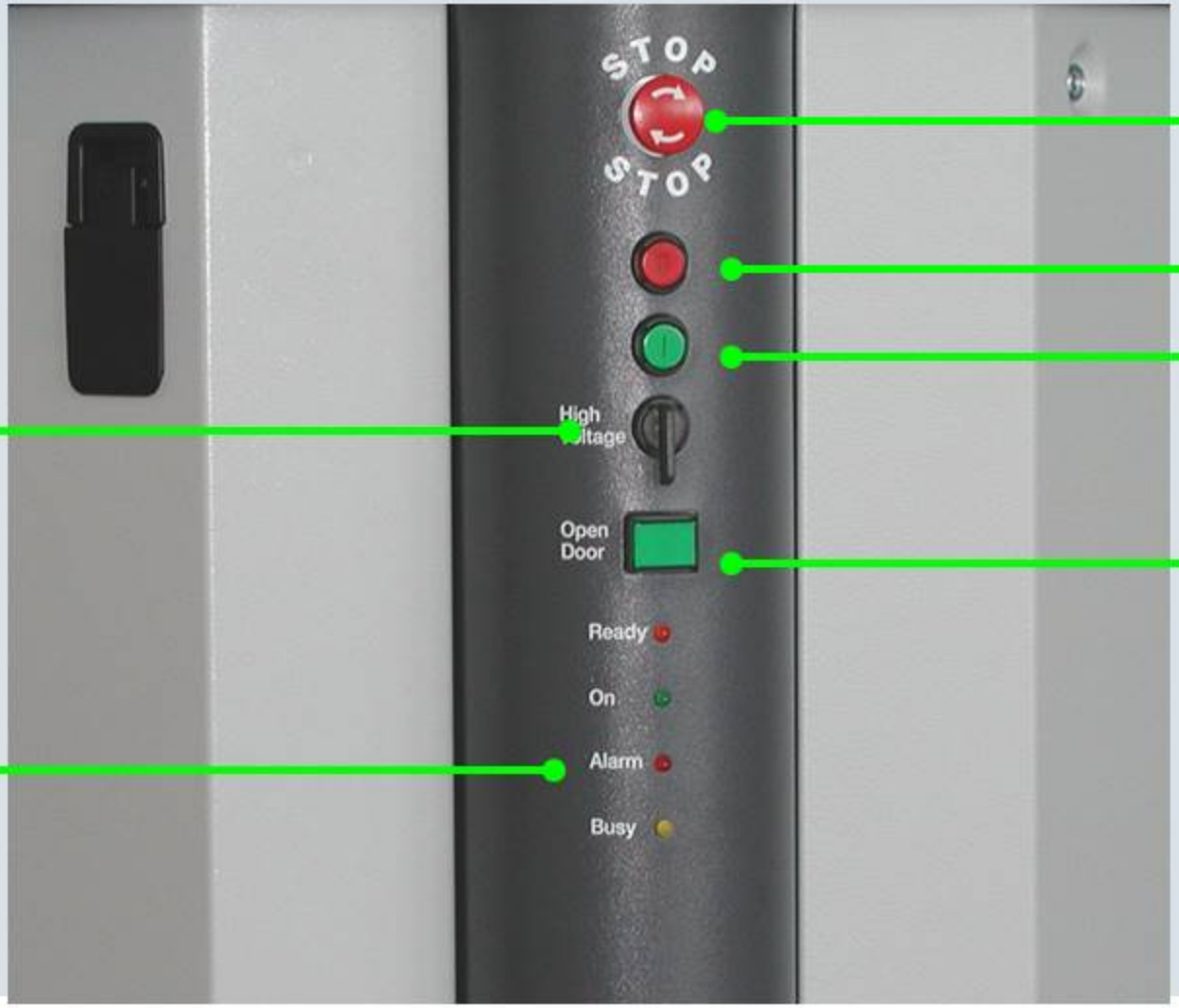
一、儀器操作面板介紹-外觀配件介紹



一、儀器操作面板介紹-右操作面板



警急停止按鈕

電源關閉

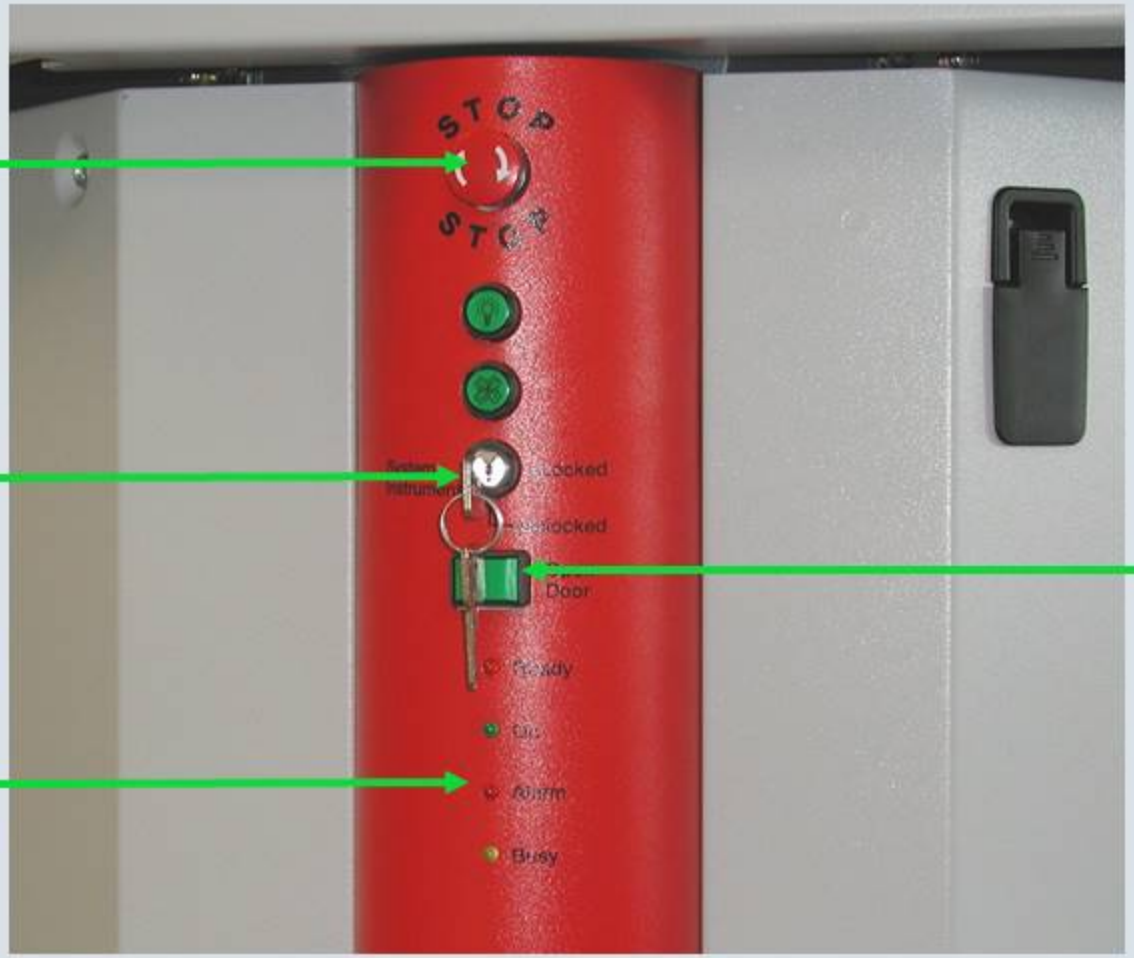
電源開啟

高壓產生器開關

開門按鈕

系統狀況燈號

一、儀器操作面板介紹-左操作面板



警急停止按鈕

系統安全鎖

開門按鈕

系統狀況燈號

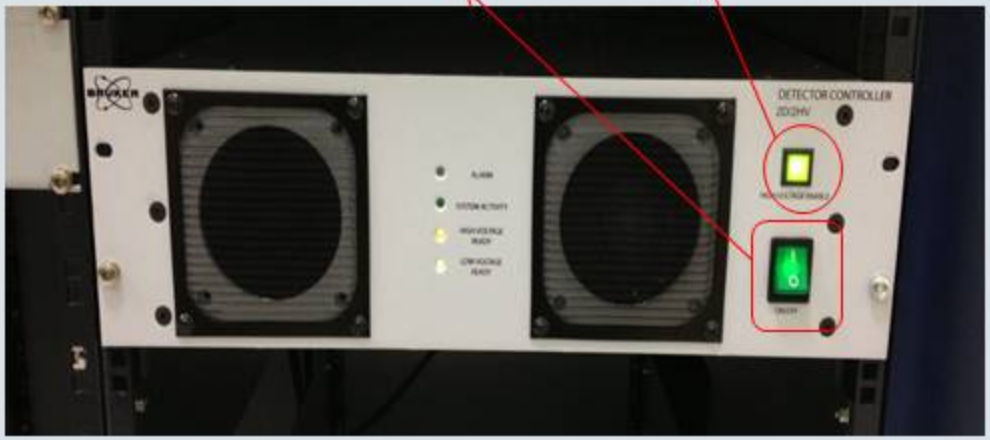
二、開機步驟-開周邊設備

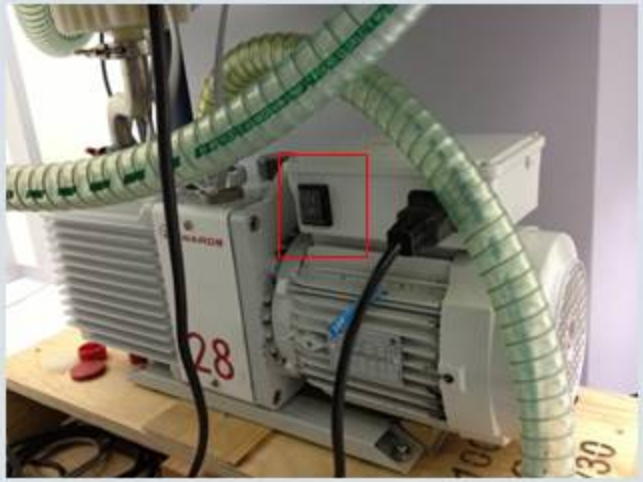
1.開冷氣(室內溫度保持在22度附近)
2.開啟冷卻循環水(21度) 如下圖

3.若電腦關閉則開啟電腦
username:Adminstrator
Password:Bruker

4.開啟偵測器主要開關

5.開啟HV Enable





6. 打開試片室真空幫浦，然後開試片室真空閥門

二、開機步驟-開啟主機

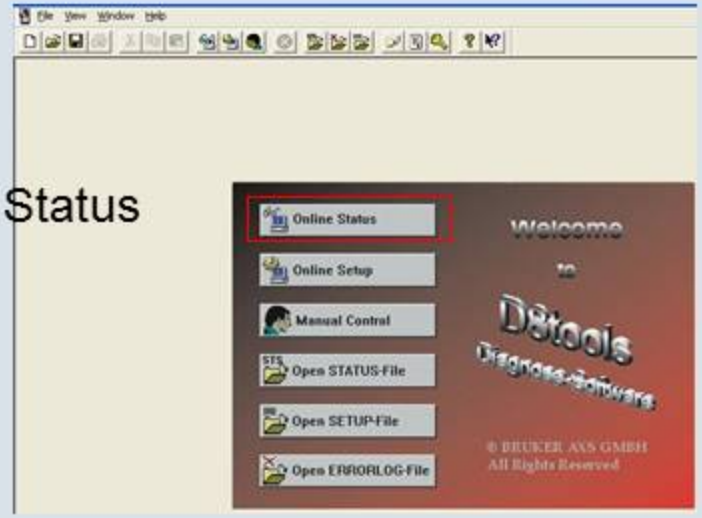
7. 按如右圖的“I”，開啟主機電源。
   *壓下按鈕後，儀器會讀取參數，約需耗時10秒左右，讀取時4個狀態燈號皆會亮起。
   *儀器的電腦讀取完參數後，只有 “On”及“Alarm”的燈號會亮起。

二、開機步驟-開啟控制軟體

8.在桌面上開D8tools軟體

10. 壓下左上角的符號
" Online Refresh On/Off"

9.選擇Online Status



*Home the motor drives- 讀取儀器資訊後，顯示如右圖

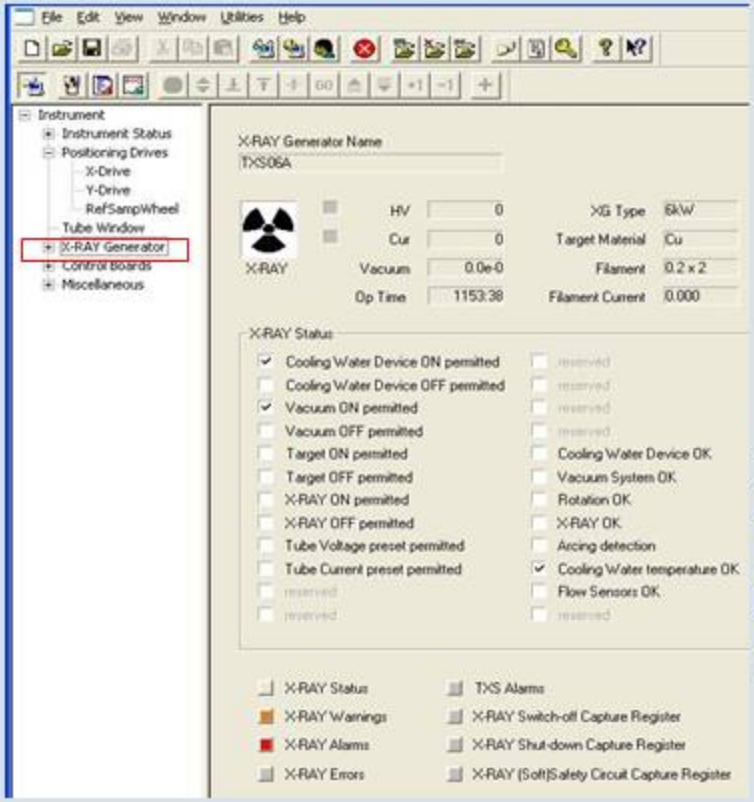
11.如果X(Y或RSW) drives等出現--.- -請執行(fine ref data)↓

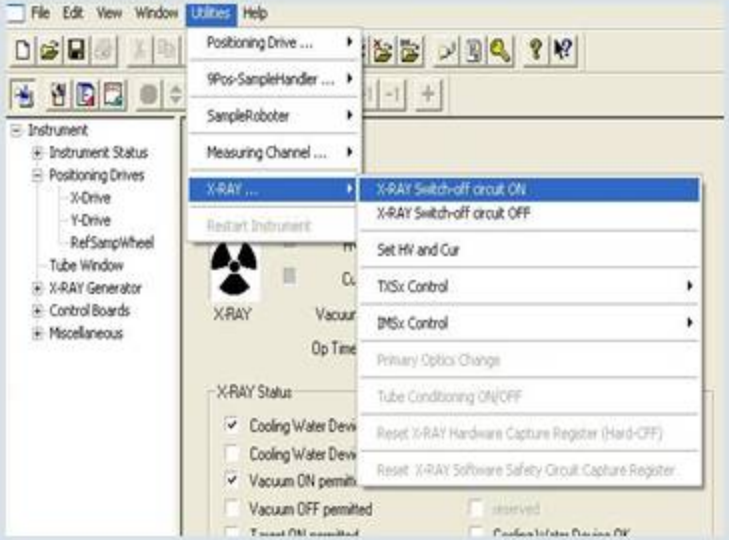
0.- -請執行(adjust)✳

如果出現limit error訊號，請先移動位置解除error

二、開機步驟-啟動真空PUMP

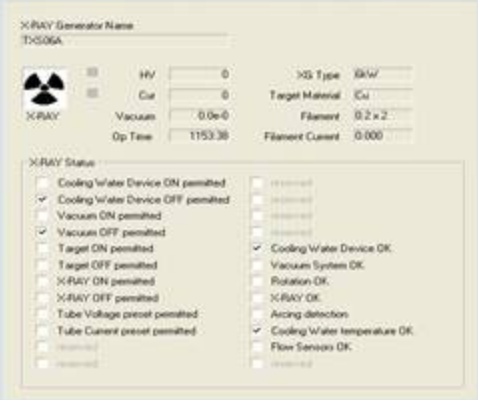
12.點選“ X-ray Generator





13.選擇 Utilities~> X-Ray~> X-ray switch-off circuit on。

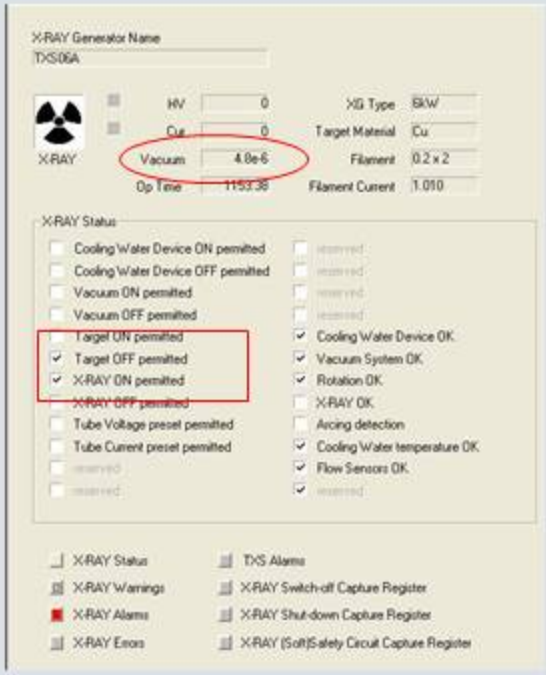
*先會聽到“咖”的聲音，接著聽到粗抽馬達啟動的聲音，狀態如右圖所示



二、開機步驟-確定真空值低於1.0e^{-6}

*粗抽馬達轉動時渦輪馬達會同時加速，加速到一定的轉速後，Vacuum會開始顯示目前的真空值

*等到Vacuum值低於5.0e^{-6}，X-ray ON permitted就會打勾，然後會聽到Anode高頻的轉動聲音，這代表Anode已經開始加速，直到真空值低於1.0e^{-6}就能開啟高壓

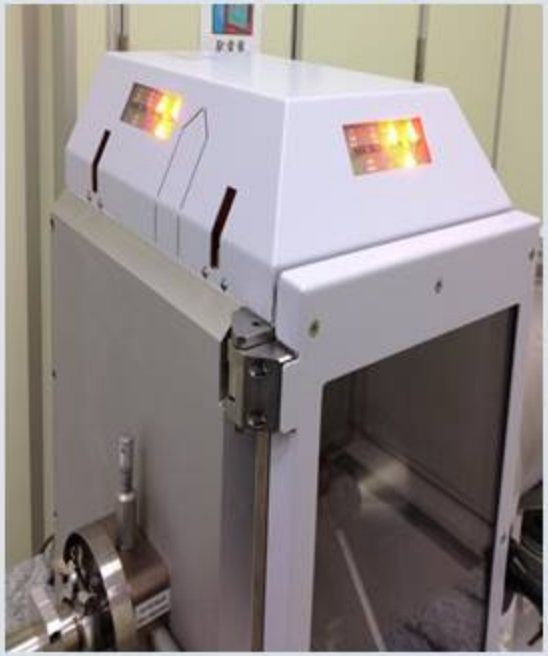


二、開機-開高壓

14.順時針旋轉高壓旋鈕3秒以上開啟X-Ray

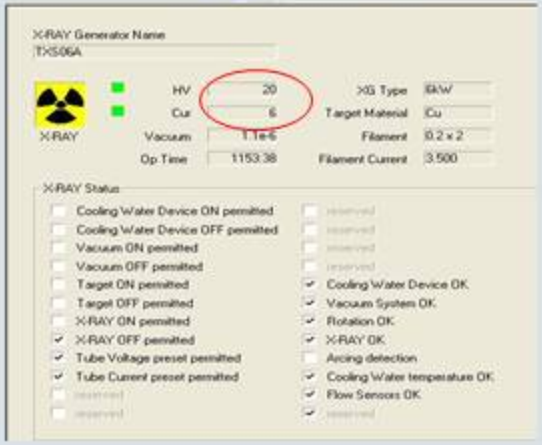
*X-Ray開啟後，Ready及On會亮起

Chamber上方的X-Ray警示燈號也會亮起

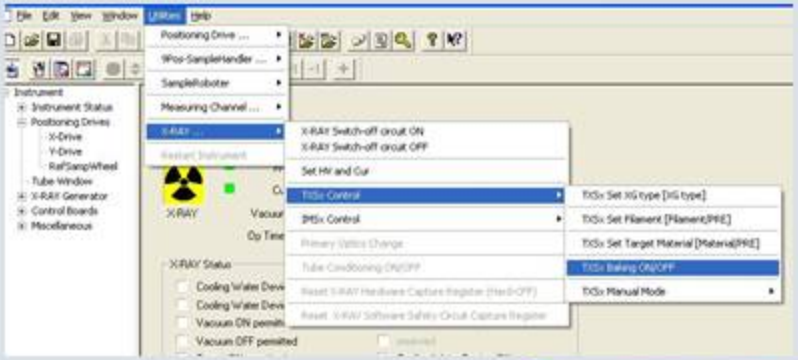


二、開機步驟-加電壓電流到50kV 50mA

*X光開啟後的HV會自動增加到"20"，Cur會增加到"6"



15.選擇 Utilities~> X-Ray ~> TXSx Control ~> TXSx Baking ON/OFF



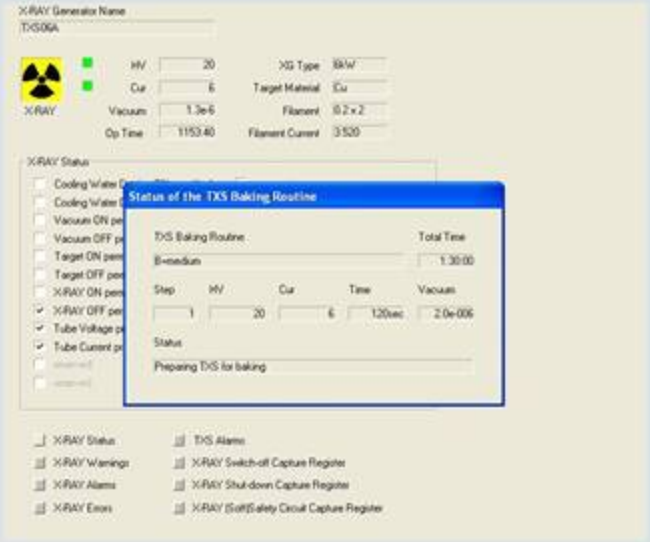
16.選擇 A=Short來執行短時間的暖機，並在Stand-by kV及mA中輸入50,50

17.選擇OK

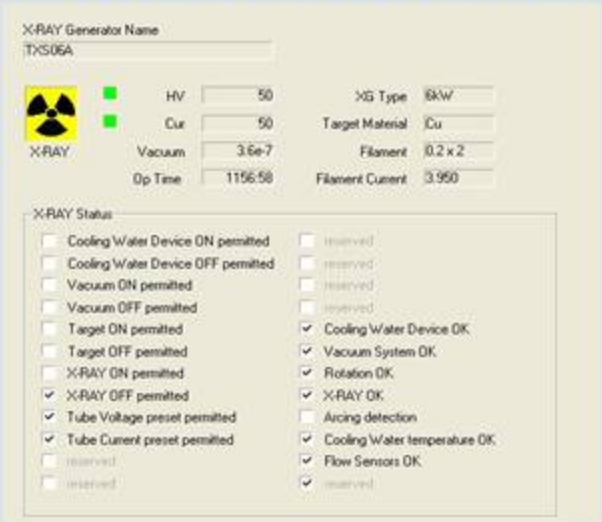
NOTE: 若此步驟遇到Error顯示"rc1 failure", 檢查是否SAXS軟體已關閉(會互搶儀器控制權)

二、開機步驟-完成開機動作

*執行Baking後會看到如以下的顯示，total time會告知你總共會花費多少的時間



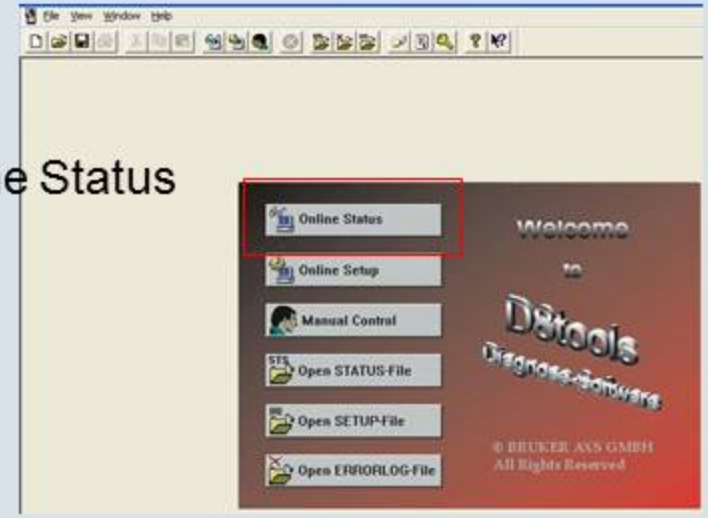
*Baking 結束後，HV會維持在50，Cur會維持在50



三、關機步驟-開啟儀器控制軟體

1. 在桌面上開起D8tools軟體

2. 選擇Online Status

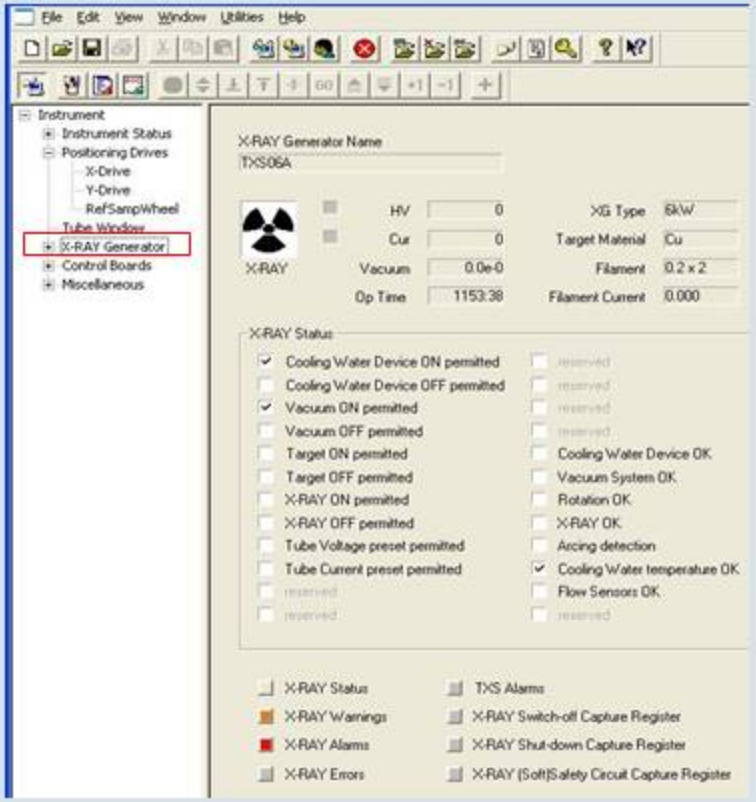


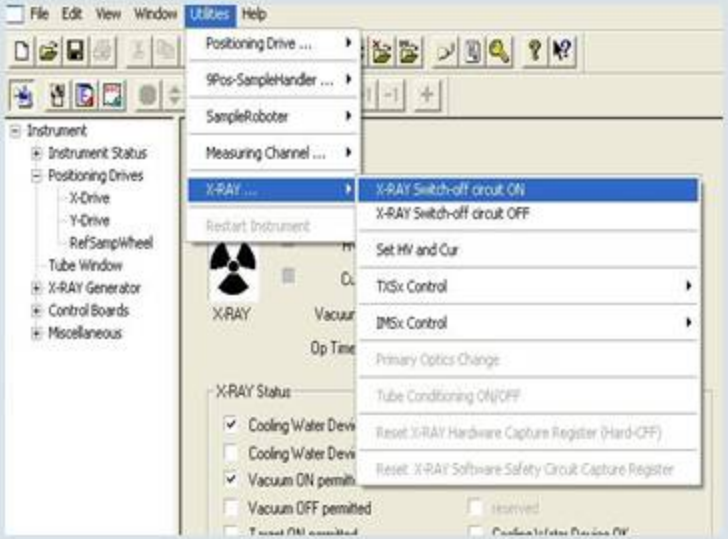
3. 壓下左上角的符號
“ Online Refresh On/Off

*讀取儀器資訊後，顯示如右圖

三、關機步驟-降電壓電流

4. 點選“ X-ray Generator

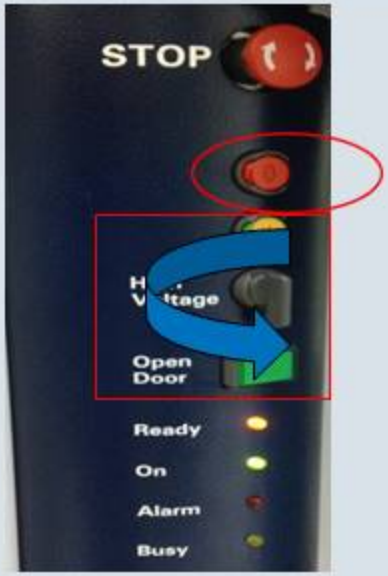


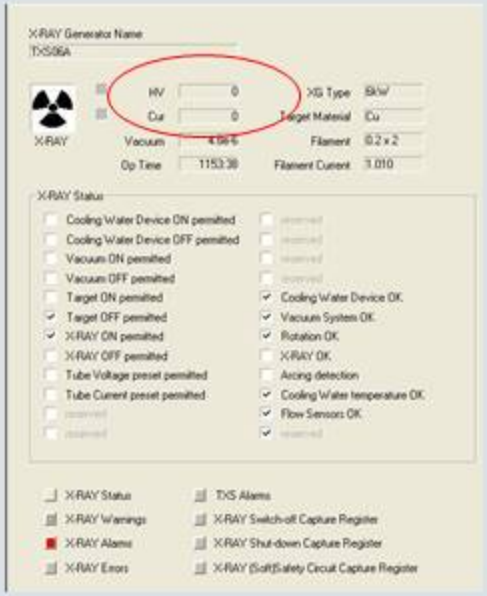


5.降電壓電流，選擇 Utilities~> X-Ray ~> Set HV and Cur ~>降到20kV,6mA-等10~15分

三、關機步驟-關閉高壓、主機及冷卻系統

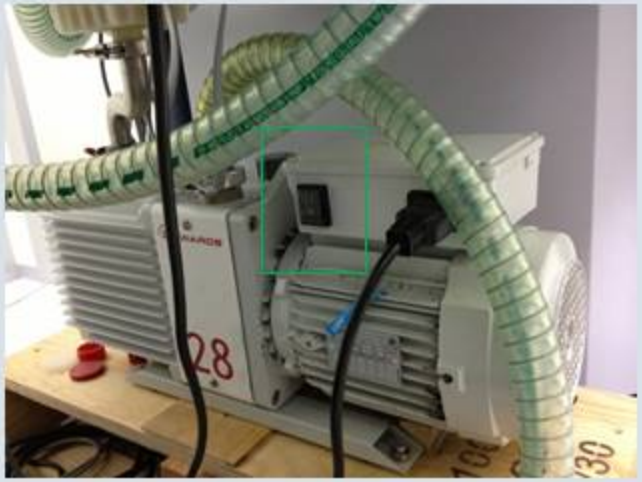
6.逆時針旋轉高壓旋鈕將X-Ray關閉，HV 及 Cur 顯示 0
7.選擇 Utilities~> X-Ray~> X-ray switch-off circuit off
*聽到Anode的轉速減慢按
8.紅色按鈕“O”，關閉主機
9.將冰水機的開關，按壓至“OFF”





三、關機步驟-關閉周邊設備

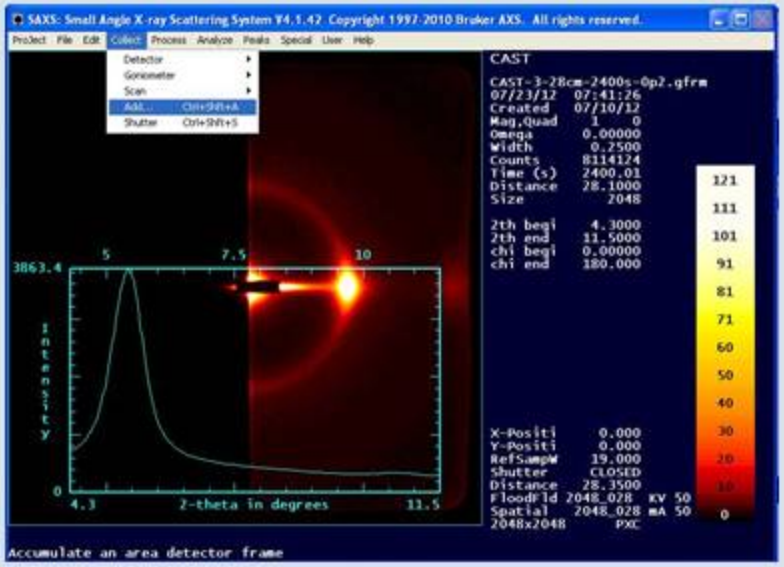
10.關閉HV Enable
11.關閉偵測器主要開關

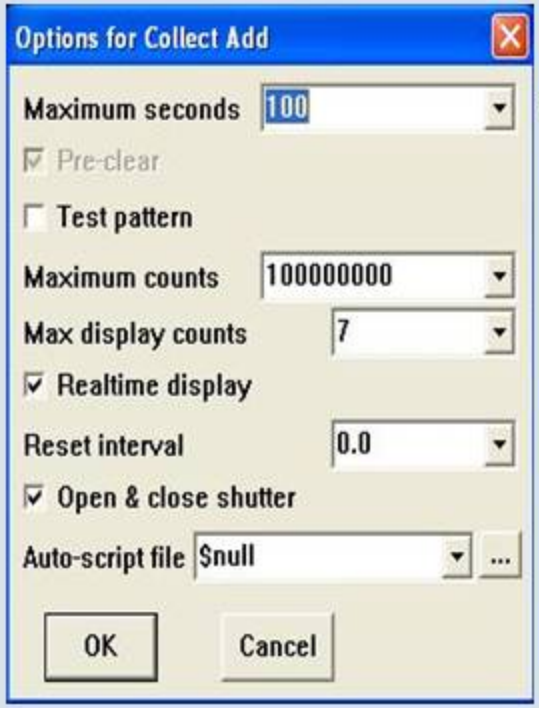


12.先關試片室真空閥門再將馬達的開關關閉(以免油氣倒灌)
13.關閉電腦
14.關閉冷氣

四、量測軟體介紹-量測指令

量測指令: Collect~>Add
※快捷鍵: Ctrl+Shift+A





最大量測時間

最大計數強度

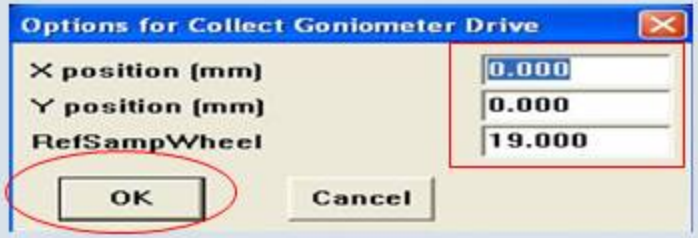
最大顯示強度

Shutter 開關

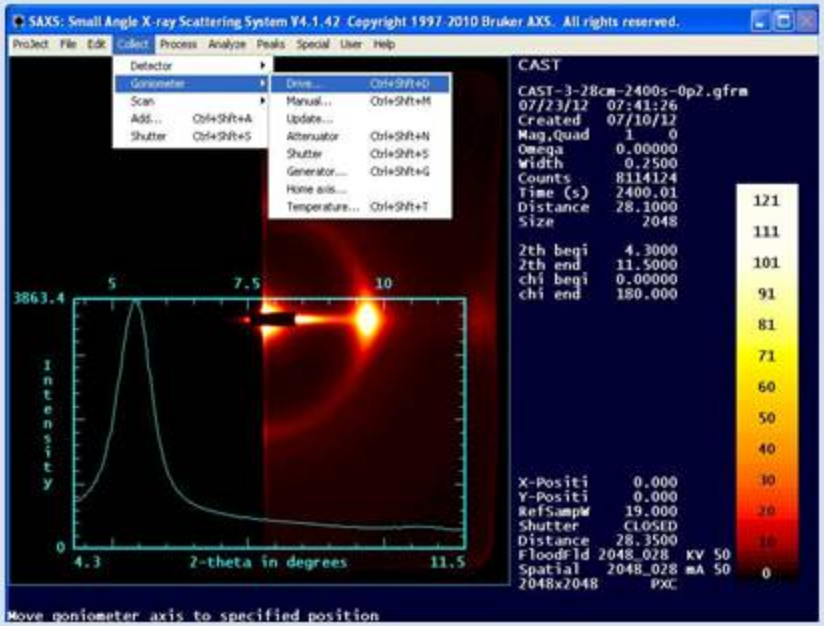
※量測的設定以最大量測時間的設定或最大計數強度的設定擇一，先滿足的就停止量測

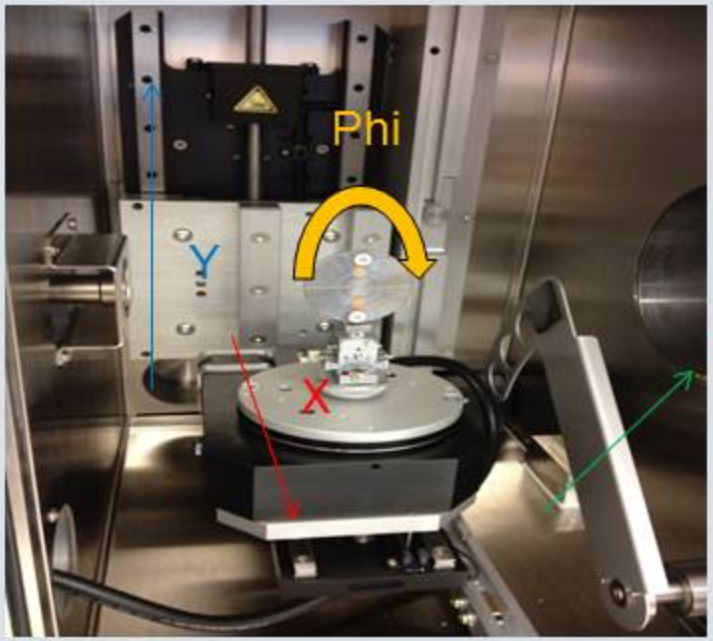
四、量測軟體介紹-移動指令

在此輸入位置



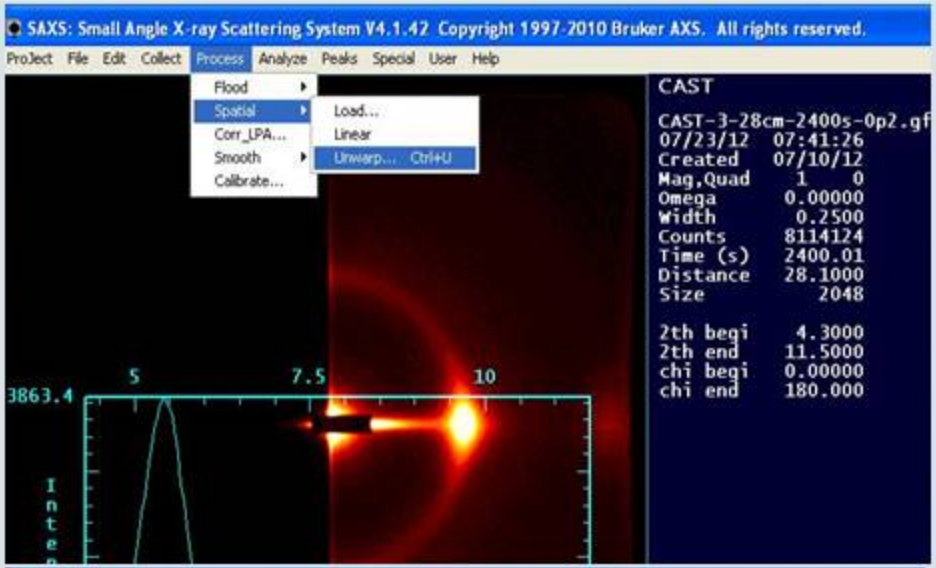
各軸的移動指令: Goniometer~>Drive
※快捷鍵: Ctrl+Shift+D

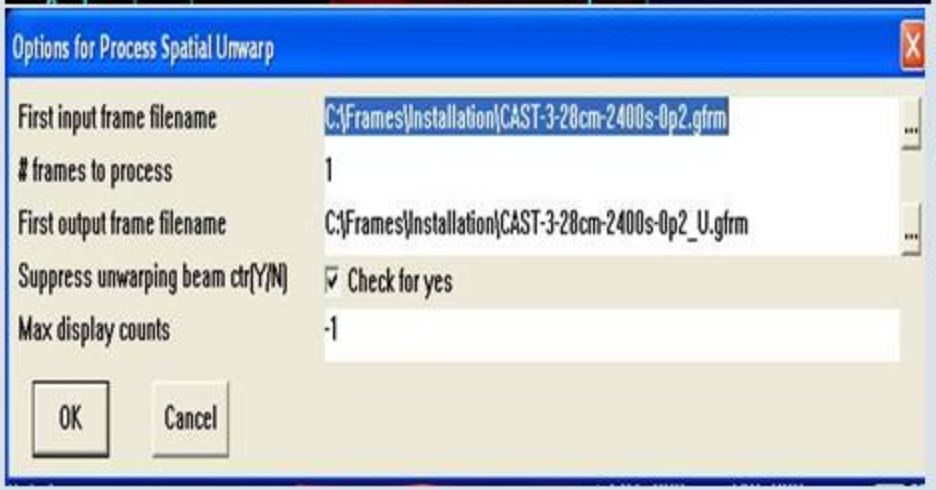




Sample wheel

四、量測軟體介紹-存檔指令





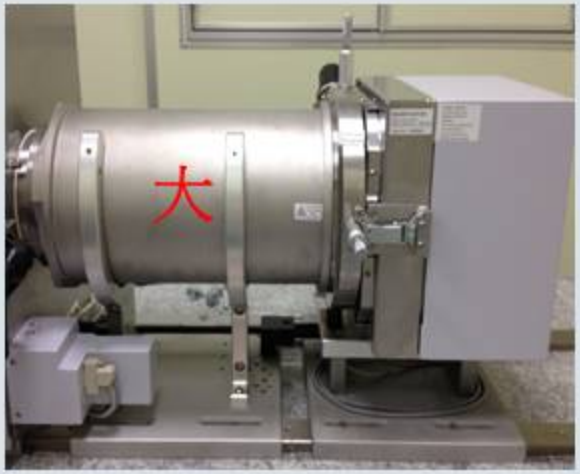
1. 轉換Pixel to 2 Theta
   Process>Spatial>Unwarp
2. 在First input frame filename 選擇要轉換的檔案
3. 在First output frame filename 選擇存放的位置及檔案名稱
4. 按"OK"

五、更換管長(改變不同的量測距離)

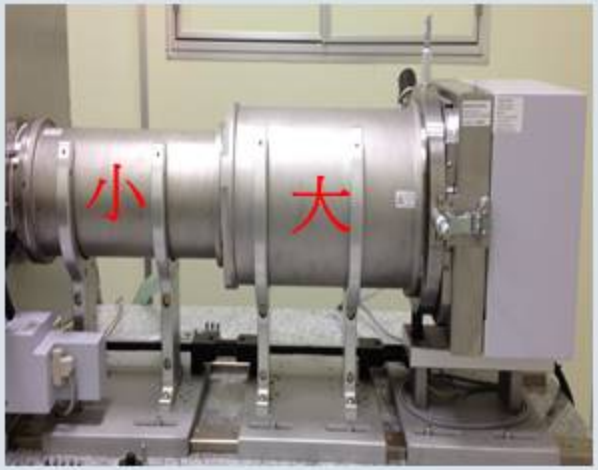
1. 更換管徑距離前，一定要記得將儀器的高壓關掉，請執行關機步驟到步驟6
2. 更換好需要的管長。(詳閱後續說明)
3. 依照開機步驟12~17執行開機動作。(只是在執行步驟13前必須先將X-ray switch circuit off 後再執行X-ray switch circuit on)。

五、更換管長-不同管長的外觀

28 cm

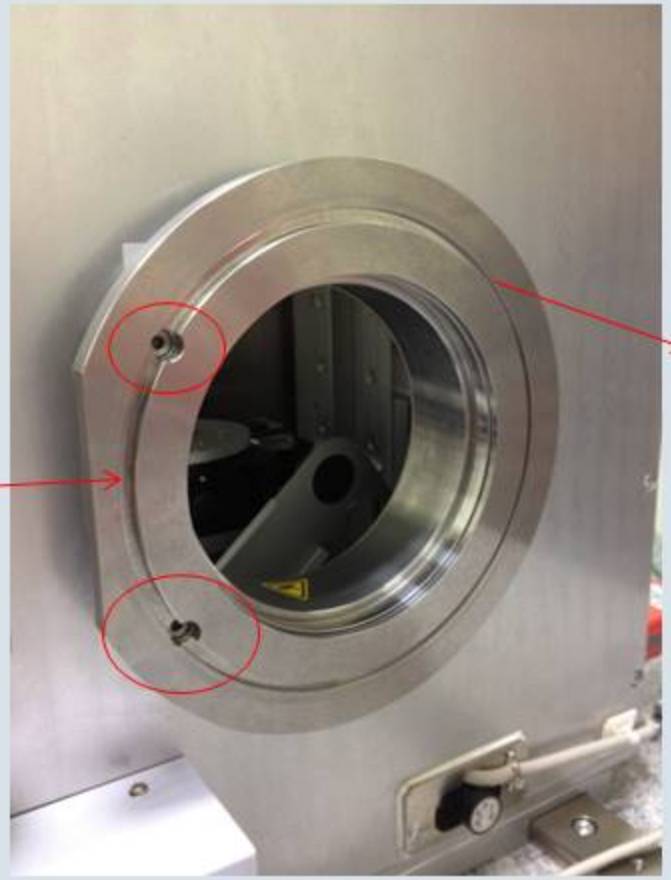


68cm



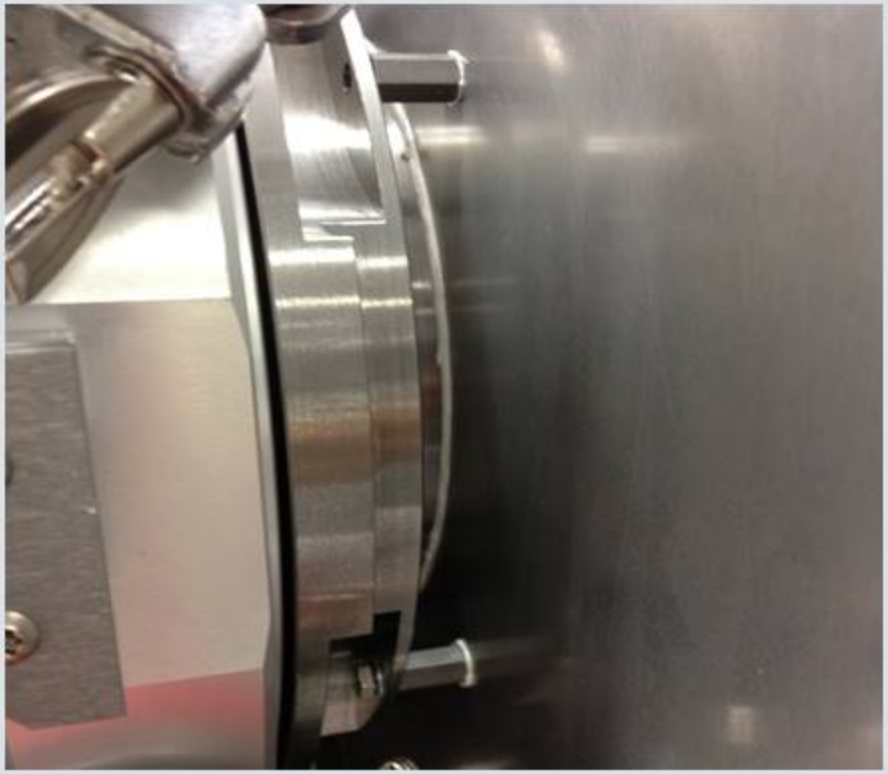
107cm

五、更換管長-28cm



1. 改變至28cm的距離，必須在chamber及beamstop之間加裝一個adapter
2. 將adapter上的螺絲鎖好，不用完全鎖緊，因為螺絲的中間有密封的o-ring，o-ring必須剛好在adapter裡

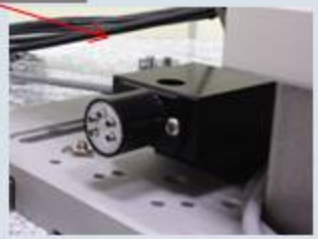
五、更換管長-28cm



Adapter另一端的螺絲也要鎖緊，這兩顆螺絲是螺帽型的需要板手來鎖緊

五、更換管長-28cm

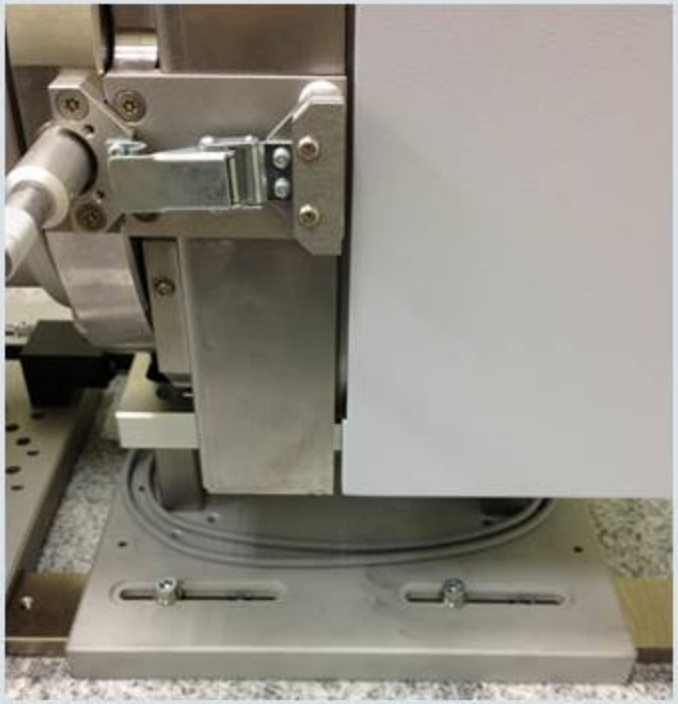
1. 將Detector往左推向adapter，小心下方的安全迴路pin腳



將Air1及Air2關閉，然後將兩個真空開關都推向"OPEN"，接著可以在微調detector跟adapter的密合度，可利用耳朵聽是否有洩氣聲，如果沒有可確認真空數值是否往低數值移動(藉由上圖的白色配件)

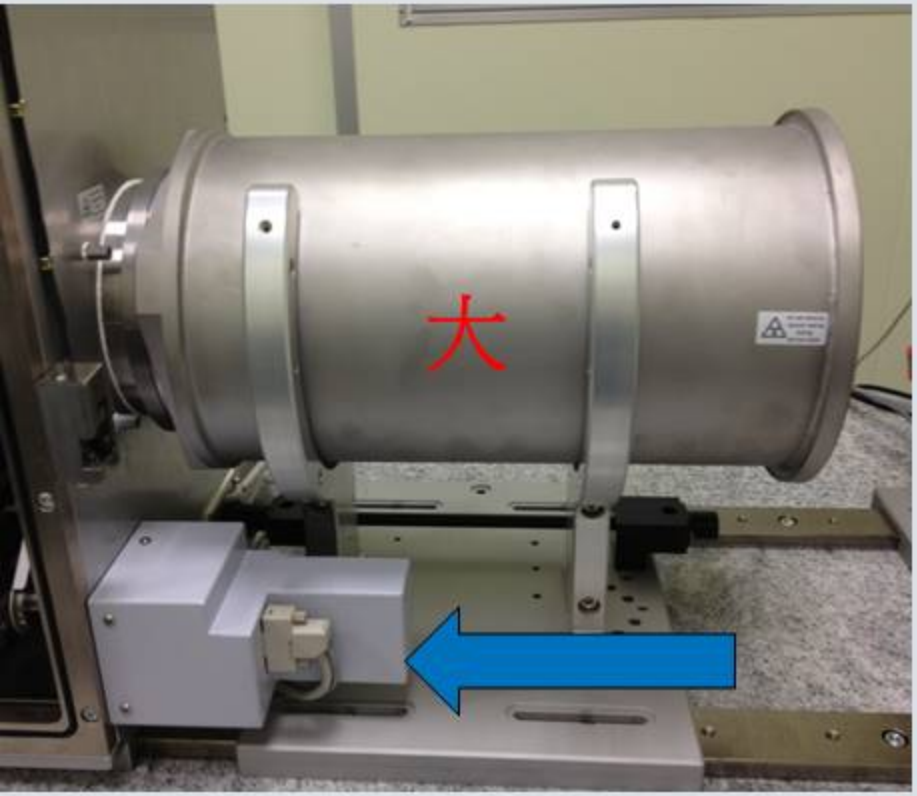
五、更換管長-28cm

將上圖的固定器具鎖好，一共有四個

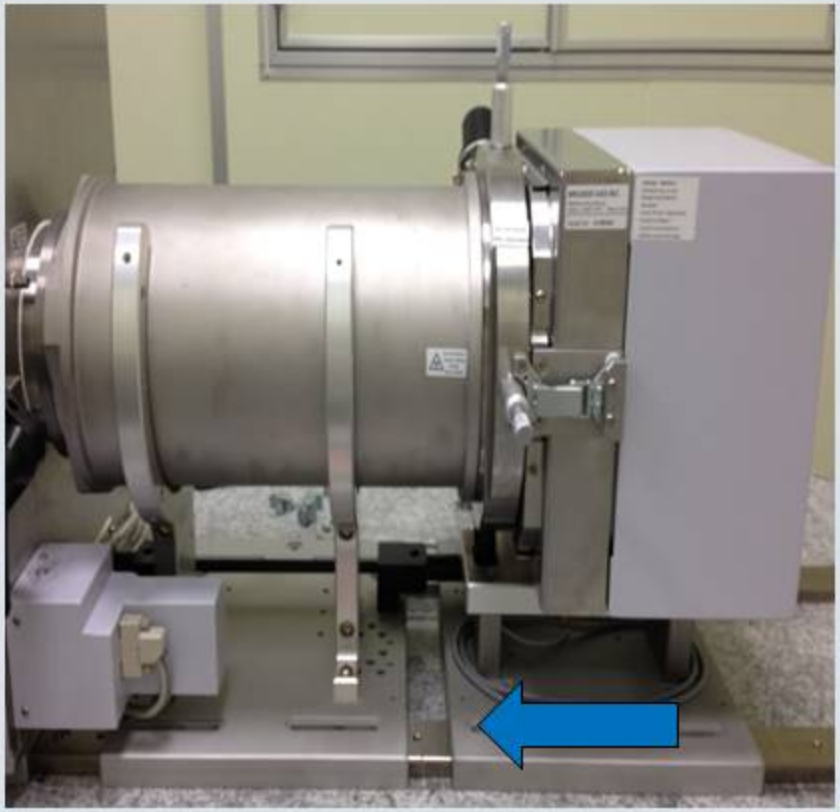


將底座的四根螺絲鎖緊

五、更換管長-68cm

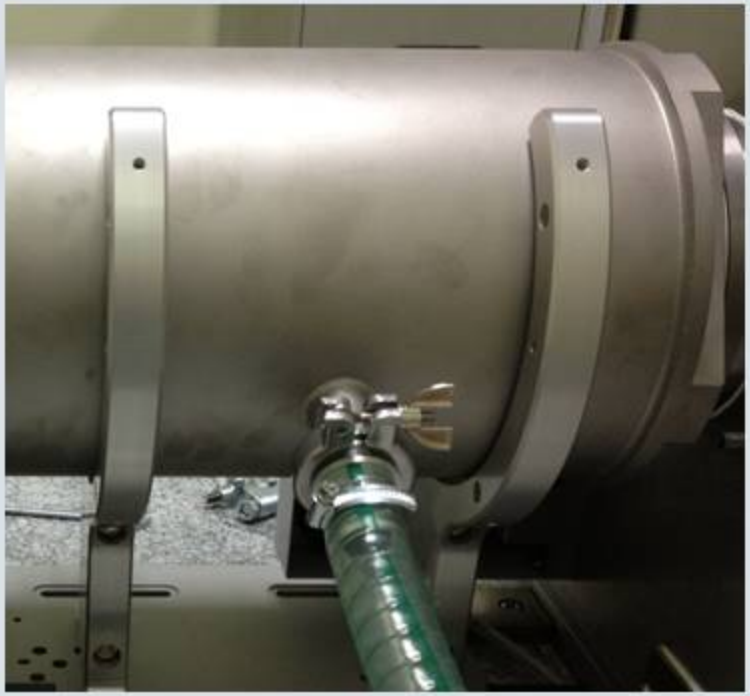


將大管子放入軌道，然後往左推緊(adapter要先拿掉)

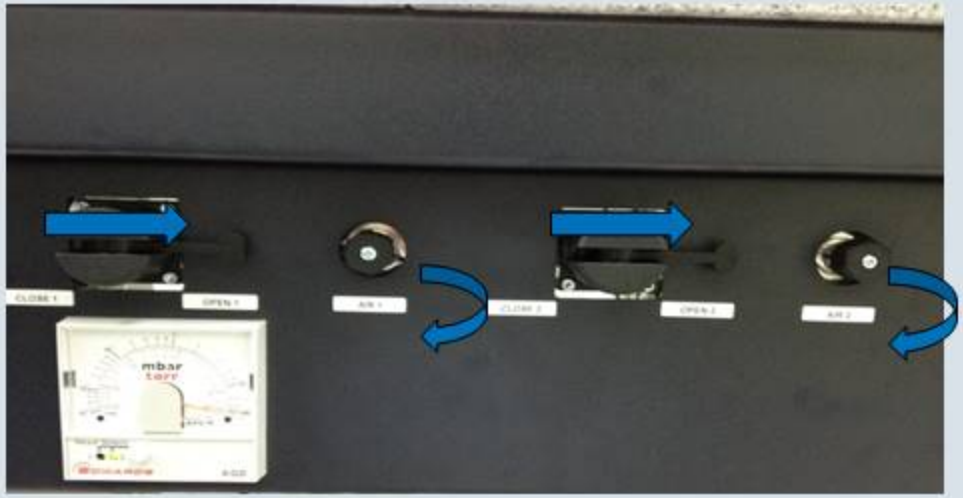


將detector往左推直到與大管子密合

五、更換管長-68cm

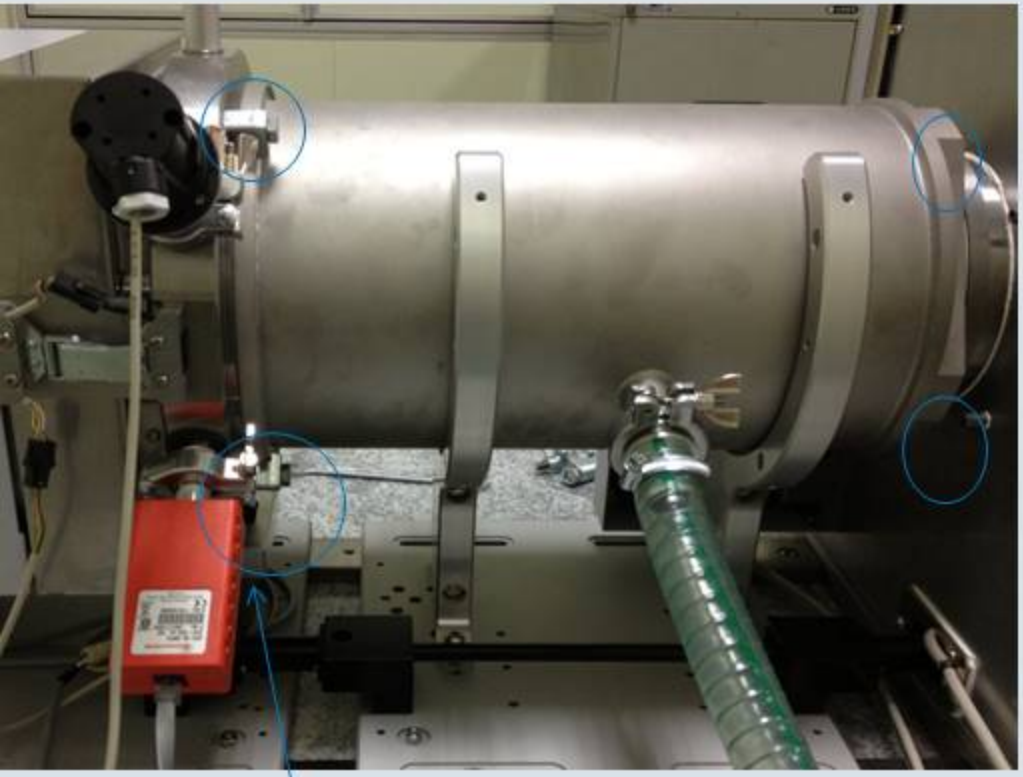


大管子的另一面有個接真空的接口必須將管子接上

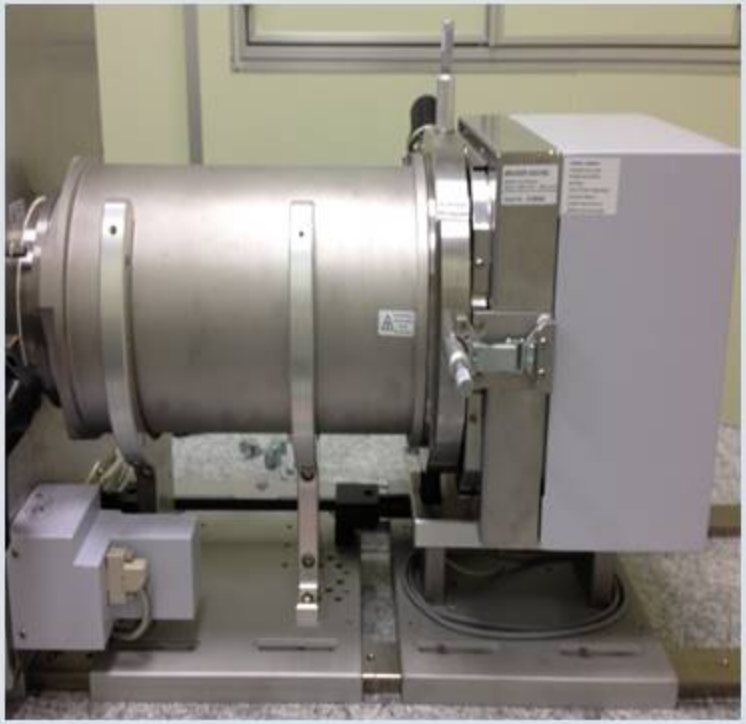


將Air1及Air2關閉，然後將兩個真空開關都推向"OPEN"，接著可以在微調detector、大管子和chamber的密合度，可利用耳朵聽是否有洩氣聲，如果沒有可確認真空數值是否往低數值移動(藉由上圖的白色配件)

五、更換管長-68cm

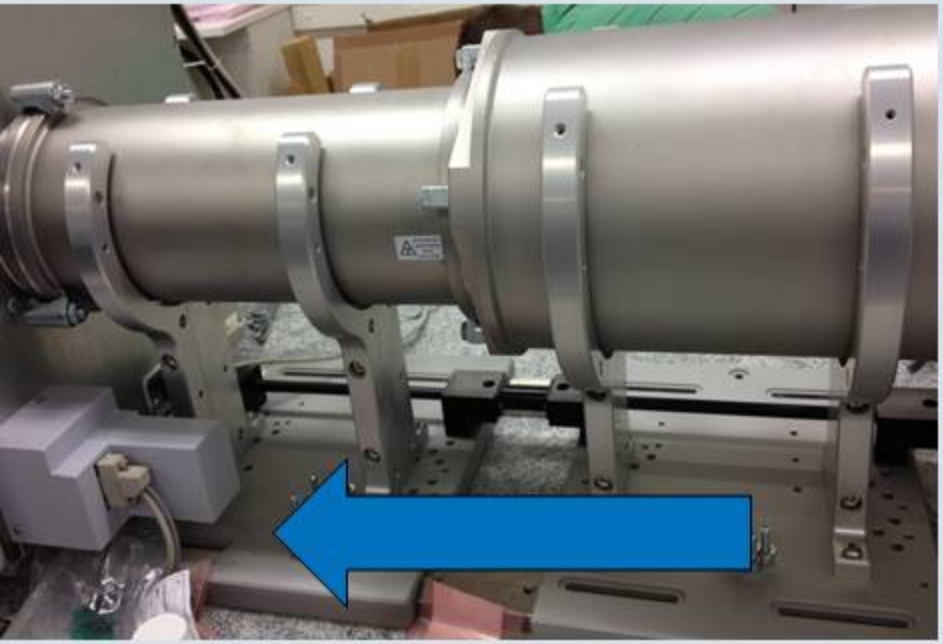


將藍色框框內的固定配件安裝好然後所緊，管子與chamber連接處有四個，管子與detector連結處也有四個

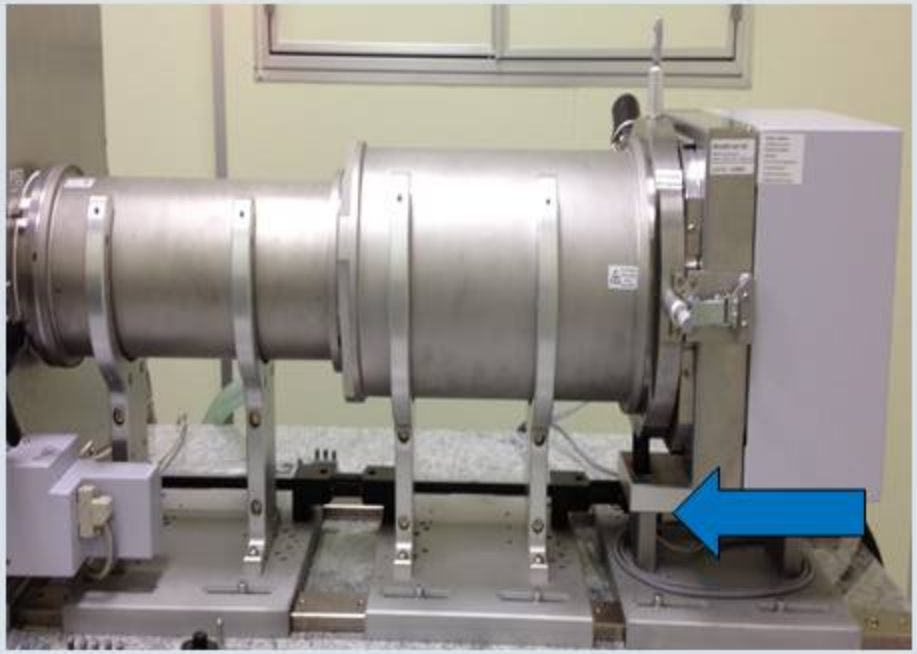


將底座的固定螺絲鎖緊

五、更換管長-128cm

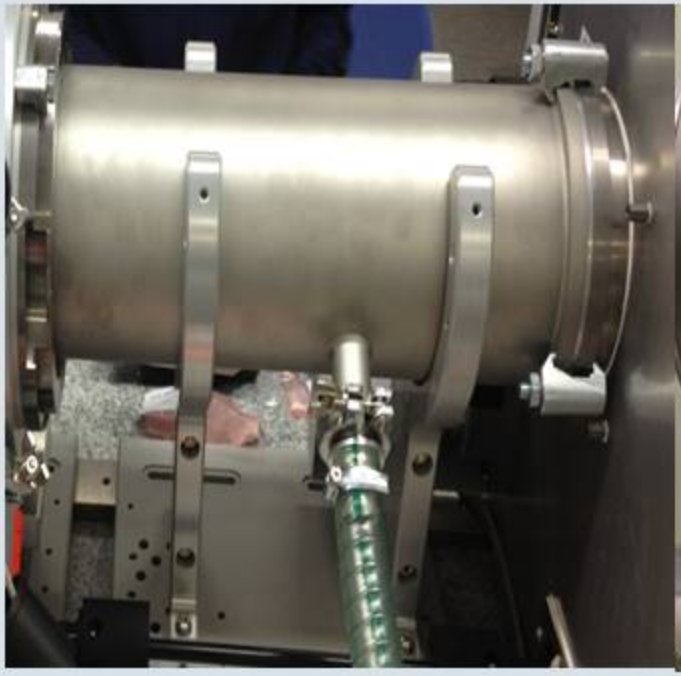


將大管子往後拉然後將小管子放在大管子前面的軌道內往chamber靠緊(小心安全pin腳)，接著大管子往左推直到與小管子密合(一樣小心pin腳)



將Detector往左用力推直到與大管子密合(小心pin腳)

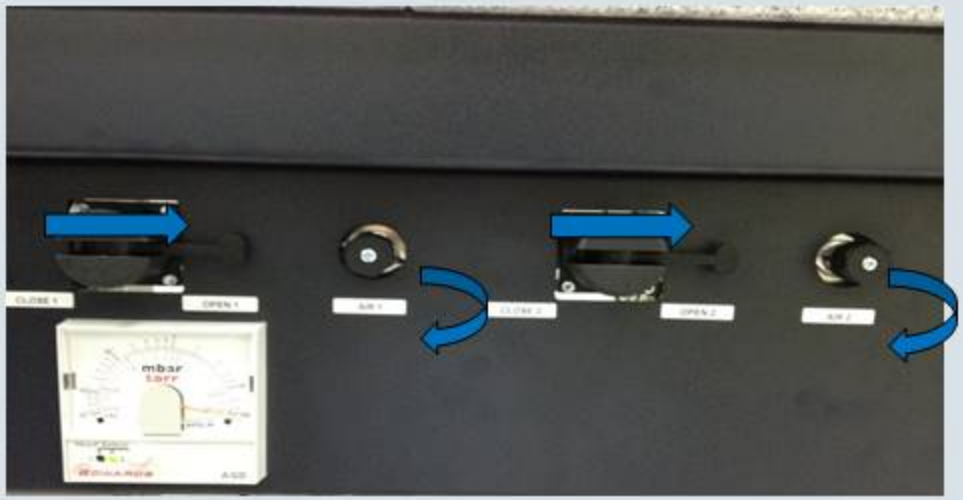
五、更換管長-128cm



小管子的另一面有個接真空的接口必須將管子接上

將大管子另一面的真空接口用cap及clamp封住

五、更換管長-128cm



將Air1及Air2關閉，然後將兩個真空開關都推向"OPEN"，接著可以在微調detector、大管子和chamber的密合度，可利用耳朵聽是否有洩氣聲，如果沒有可確認真空數值是否往低數值移動(藉由上圖的白色配件)

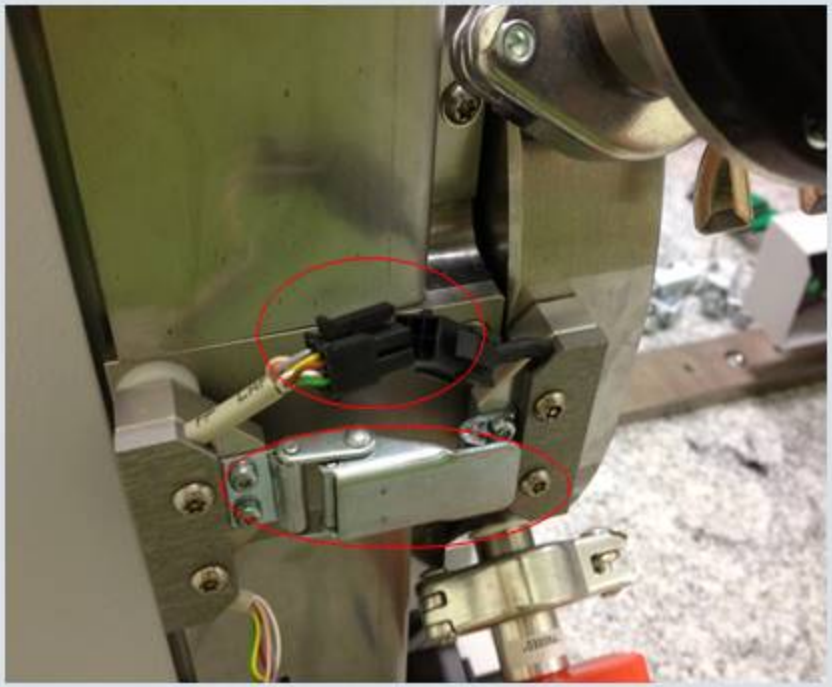
將所有連結處的固定配件所緊，然後鎖緊所有底座的螺絲

※打開X-Ray，請參閱點燃X-Ray步驟

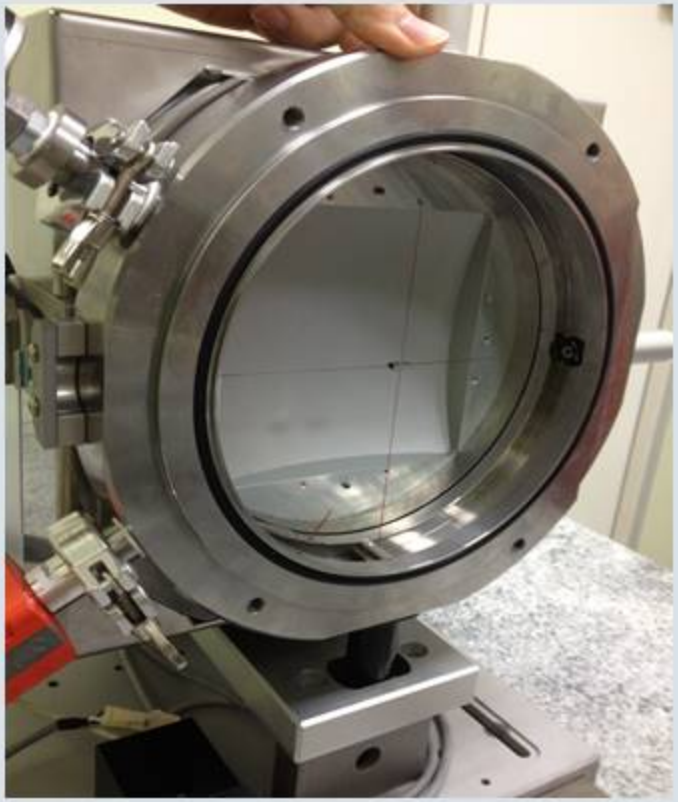
六、更換Beam Stop

1. 更換Beam Stop之前必須先將高壓關閉，請執行關機步驟到步驟6
2. Beam Stop本體為鉛，請注意勿碰撞，不使用時請將其置放於保存盒內
3. High Flux- 4.31mm, 4.2mm,3.15mm
4. High Resolution- 1.6mm
5. 通常更換Beam Stop後必須隔夜再做實驗，使支撐Beam Stop的高分子線乾燥，位置才會穩定。
6. 依照開機步驟12~14執行開機動作。(只是在執行步驟13前必須先將X-ray switch circuit off 後再執行X-ray switch circuit on)。此時電壓電流保持在20kV,6mA。
7. 隔天再執行開機步驟15~17，將電壓電流升到50kV，50mA。

六、更換Beam Stop



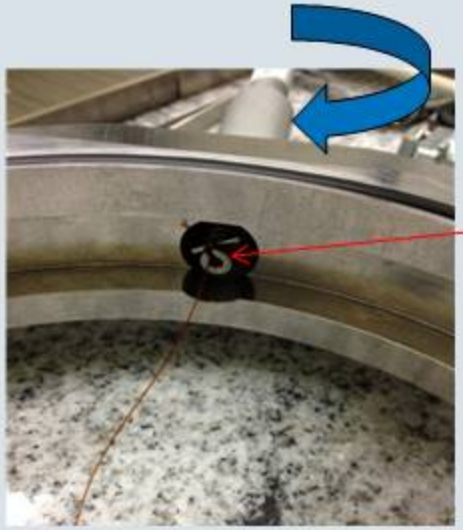
將beam stop的夾具上的安全回路分開，然後將夾具兩旁的lock鬆開

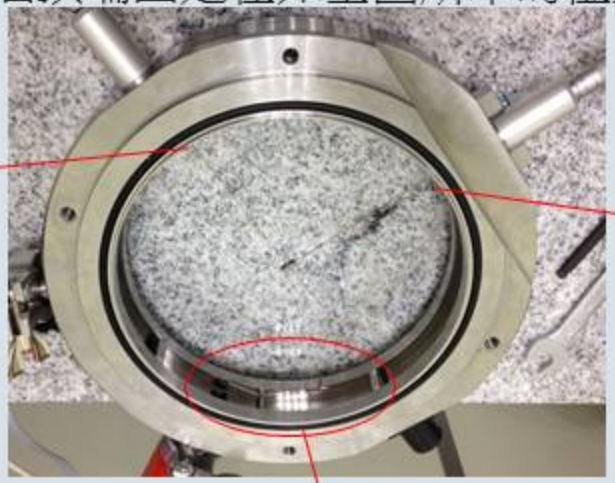


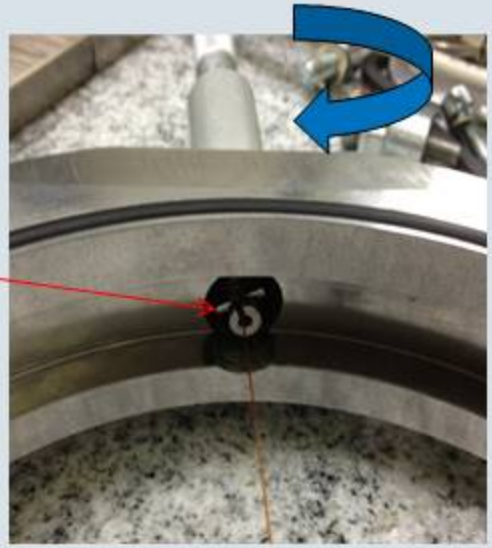
手握夾具的上方將其直直的往上拉

六、更換Beam Stop

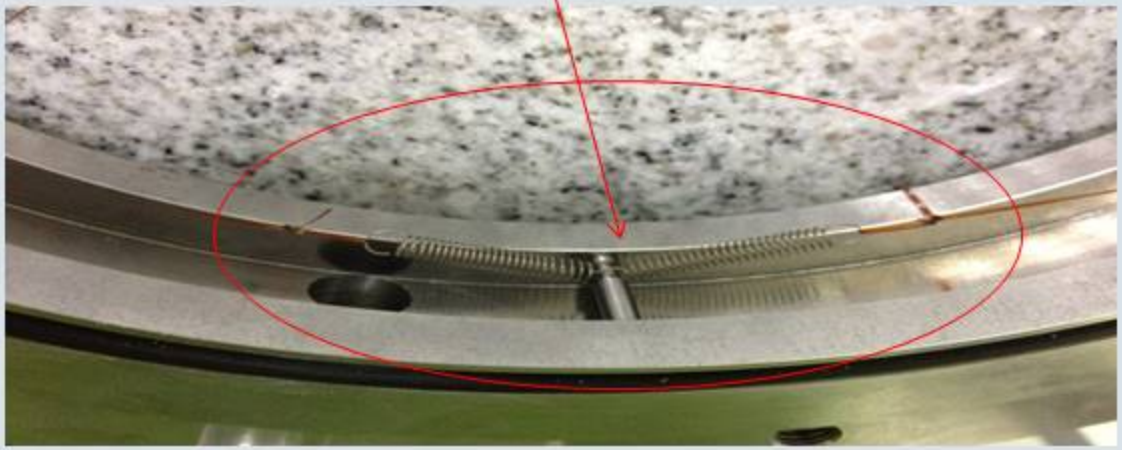
將四個頂端固定在如全圖所示的位置





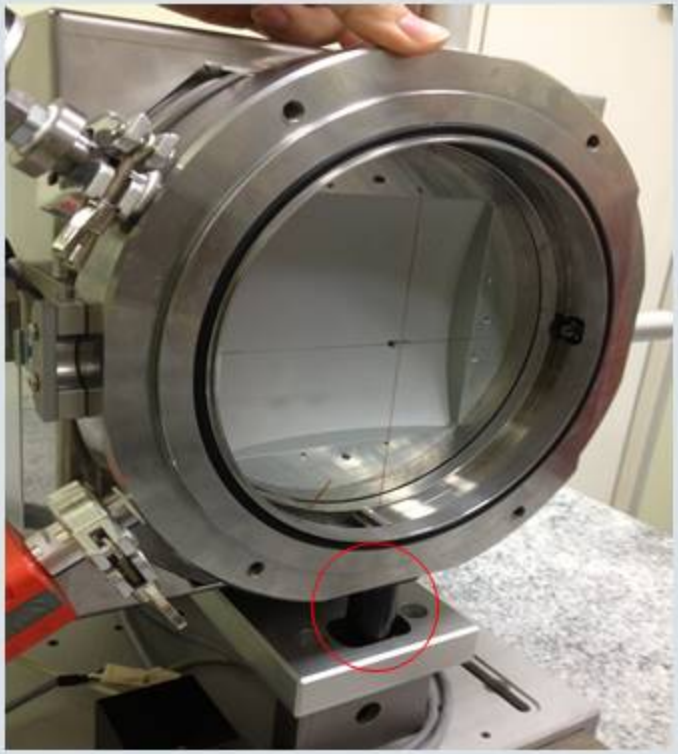


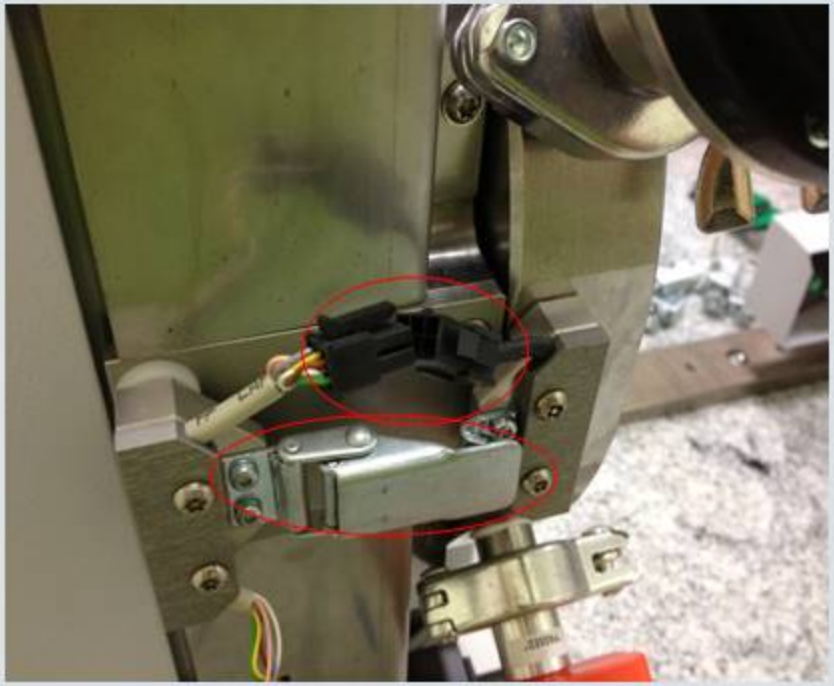
順時針轉到底，以方便套beam stop



順時針轉到底，以方便套beam stop

六、更換Beam Stop





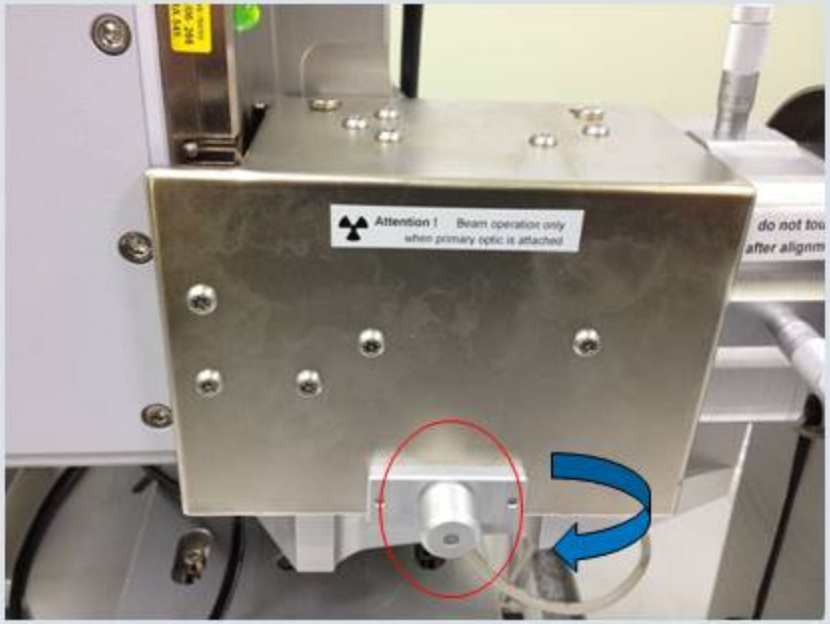
手握夾具的上方將其直直的往下放，確認黑色接頭兩端的pin腳在合適的位置

※Pin的腳位接錯會有導致機器損壞的危險

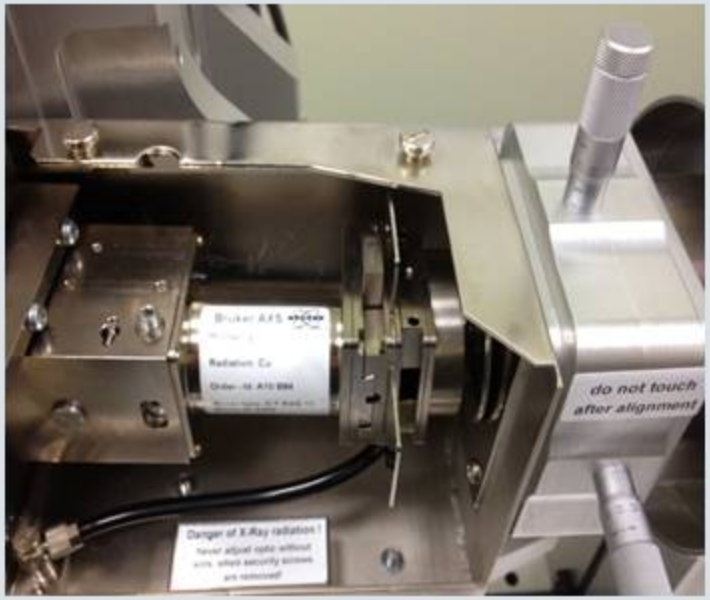
將beam stop的夾具上的安全回路連結，然後將夾具兩旁的lock鎖緊

※打開X-Ray，請參閱點燃X-Ray步驟

六、更換Beam Stop-調整位置 Step1

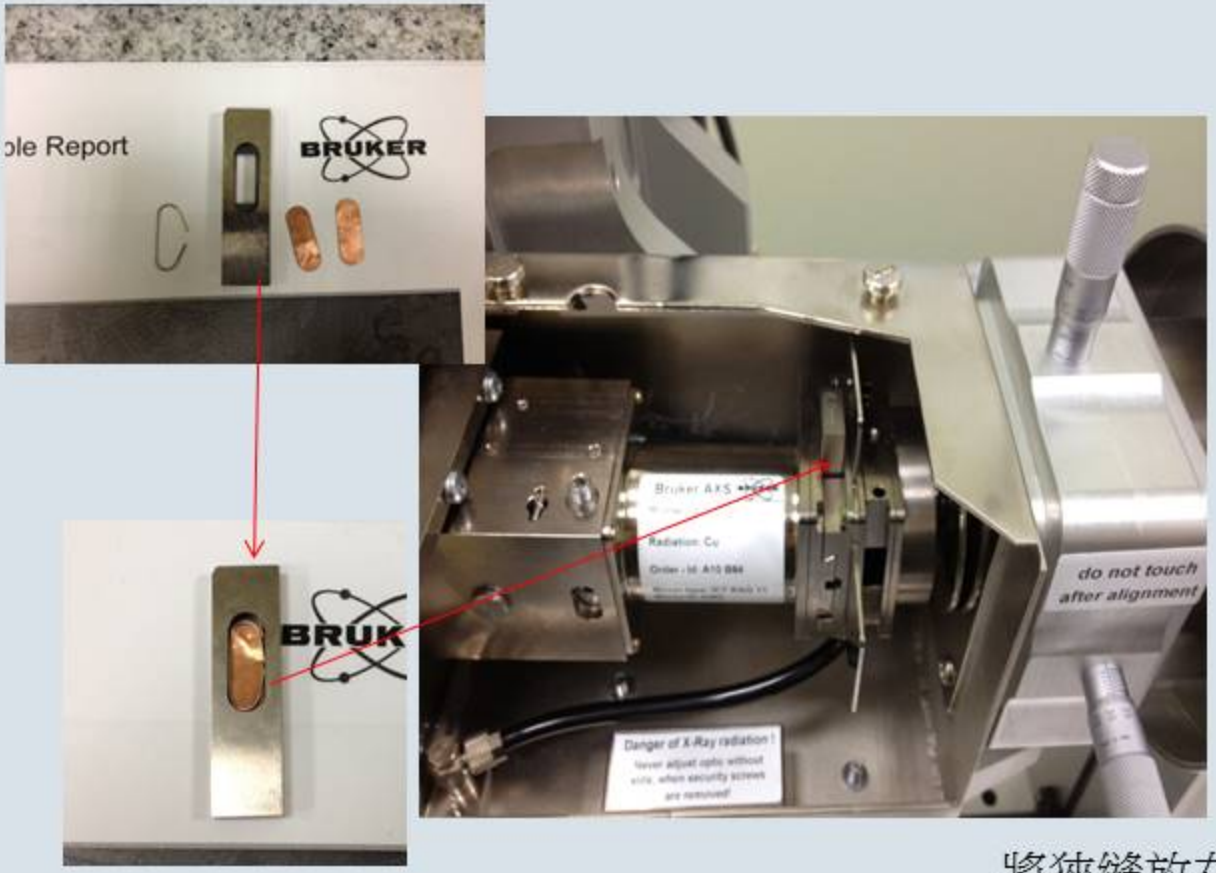


將Lock順時針旋轉後會自行彈開，將蓋子往自己的方向拉，然後向上提後將蓋子拿開



接著將Slit從holder裡拿出來

六、更換Beam Stop-調整位置 Step2

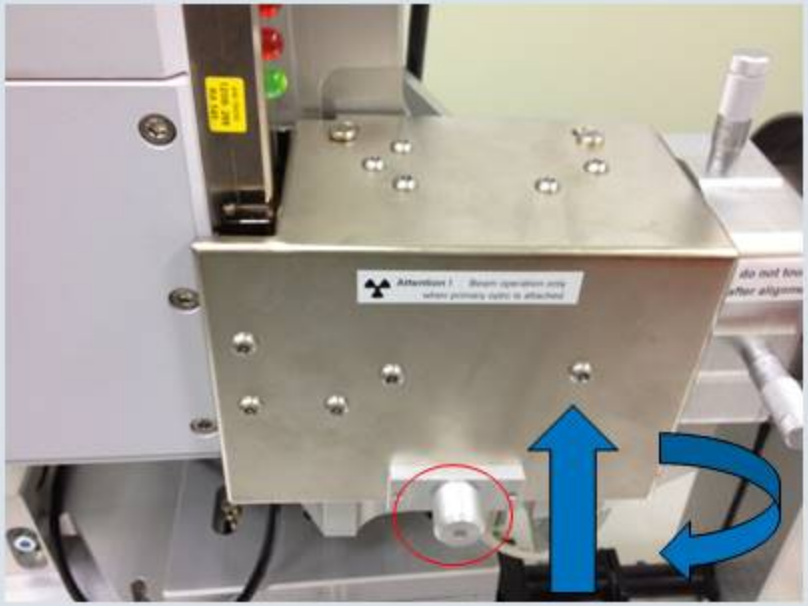


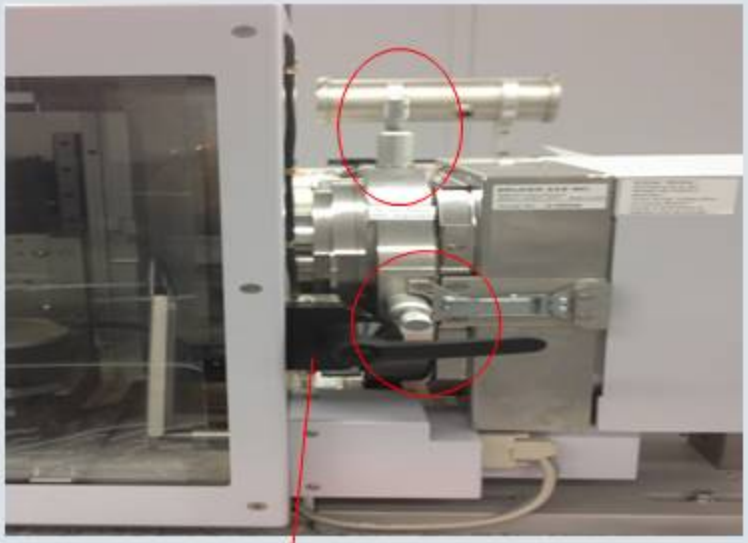
將銅片入洞裡然後固定

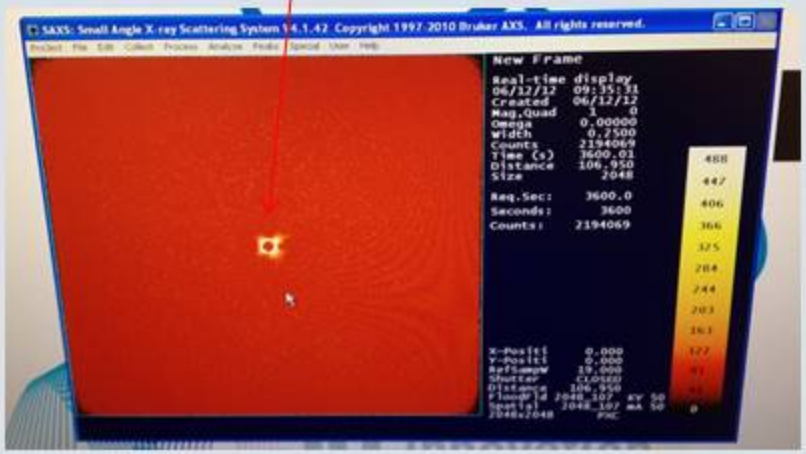
將狹縫放在插槽裡

六、更換Beam Stop-調整位置 Step3

調整X及Y方向然後做量測，直到Beam Stop在beam的正中心

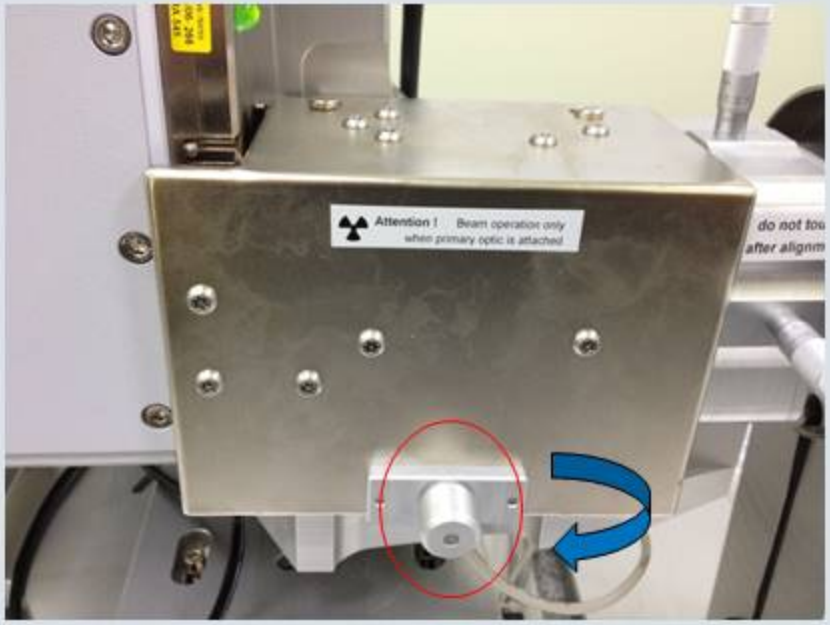




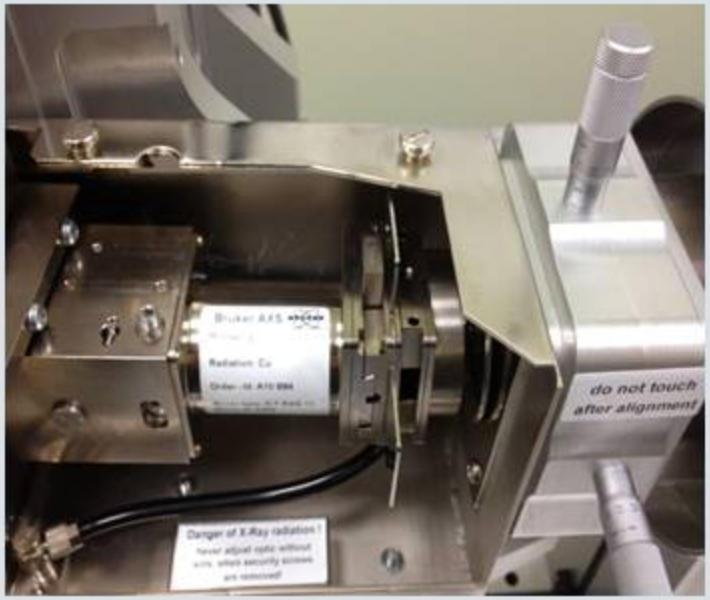


將蓋子蓋回去，然後將LOCK往內推，接著順時針旋轉將蓋子鎖住

六、更換Beam Stop-調整位置 Step4



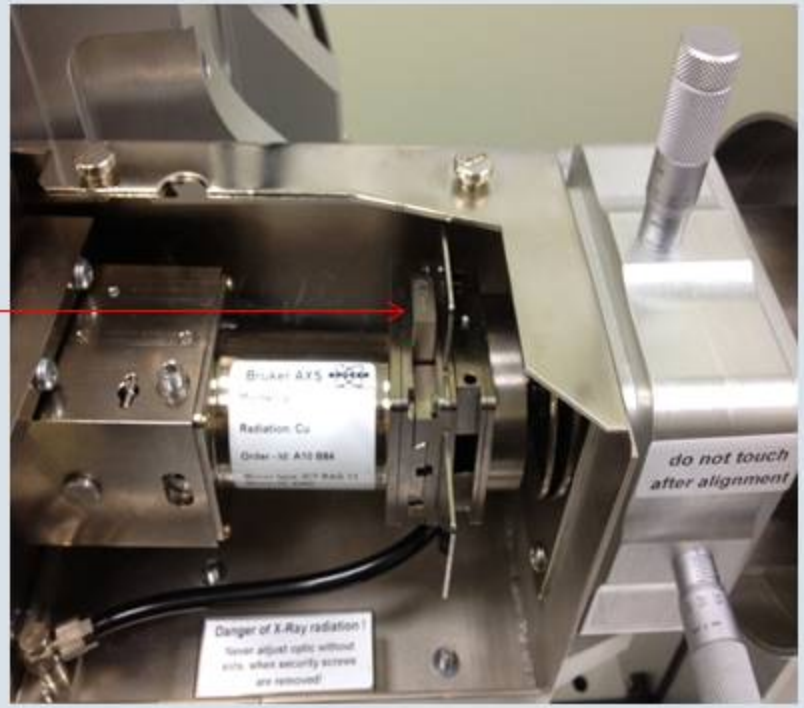
將Lock順時針旋轉後會自行彈開，將蓋子往自己的方向拉，然後向上提後將蓋子拿開



接著將Slit從holder裡拿出來

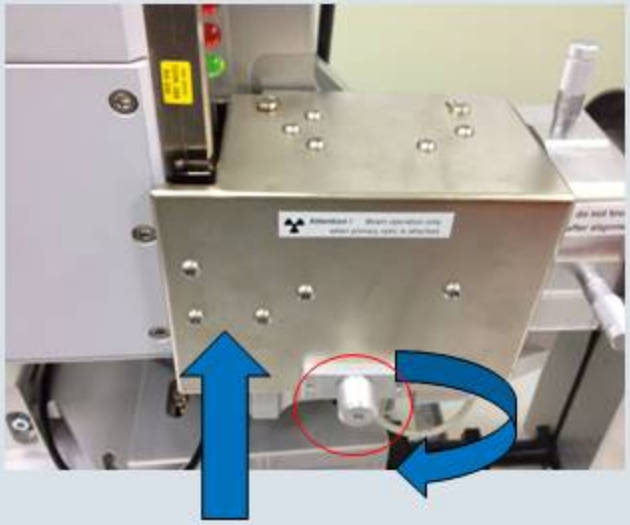
六、更換Beam Stop-調整位置 Step5

將衰減片拿掉

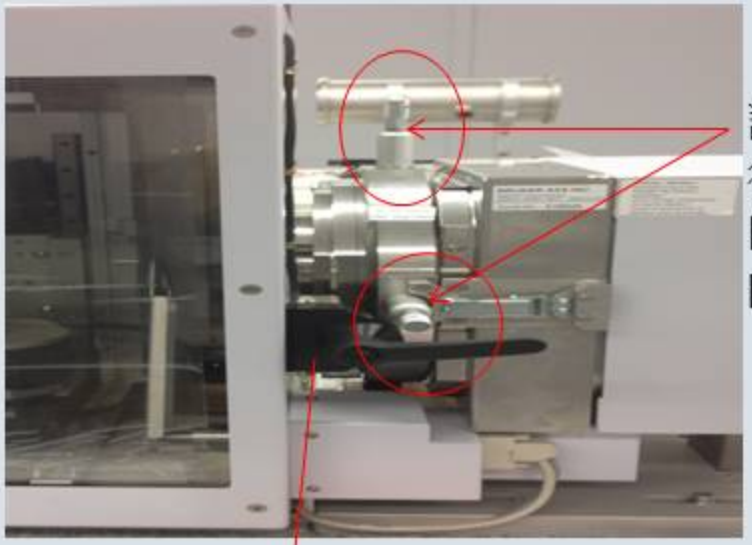


將狹縫放在插槽裡

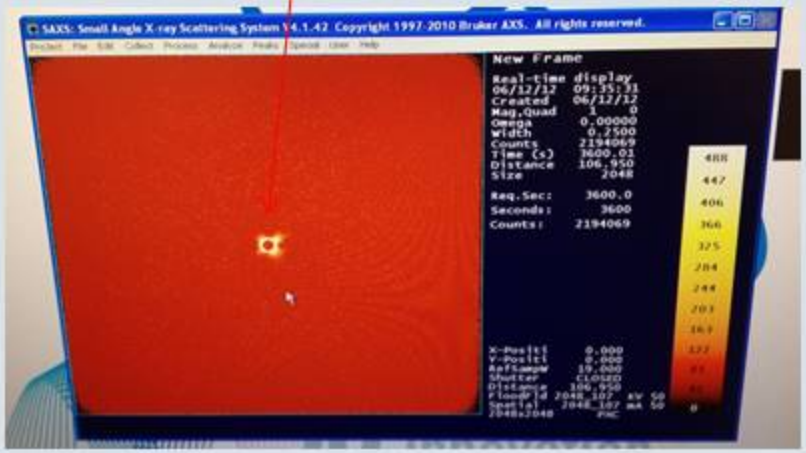
六、更換Beam Stop-調整位置 Step6



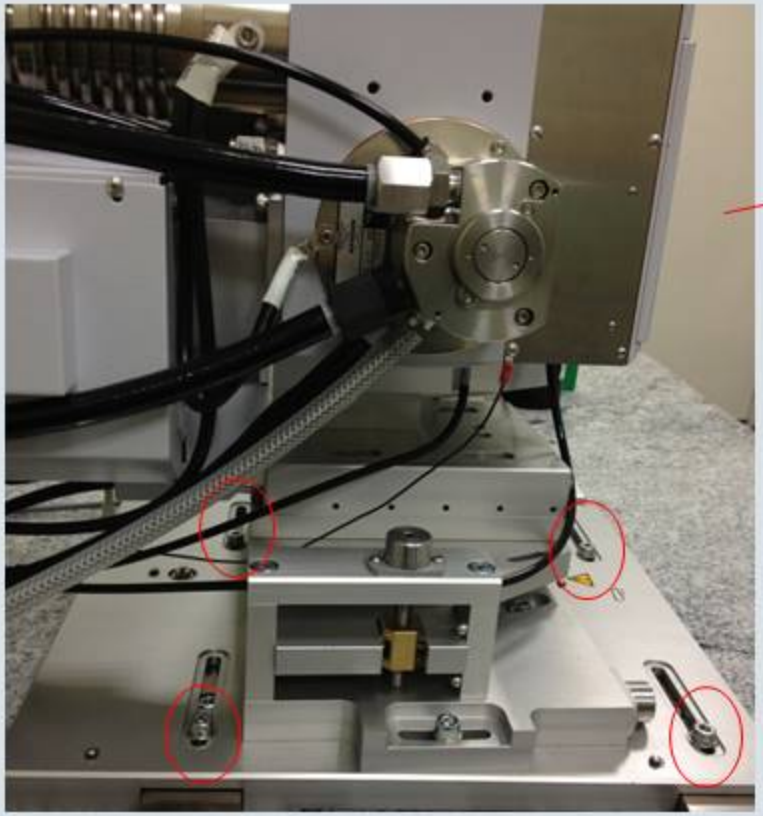
將蓋子蓋回去，然後將LOCK往內推，接著順時針旋轉將蓋子鎖住



調整X及Y方向然後做量測，直到Beam Stop在beam的正中心

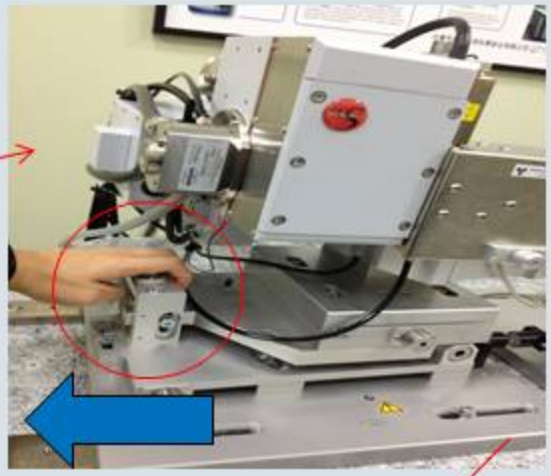


七、安裝真空屏蔽配件-step1

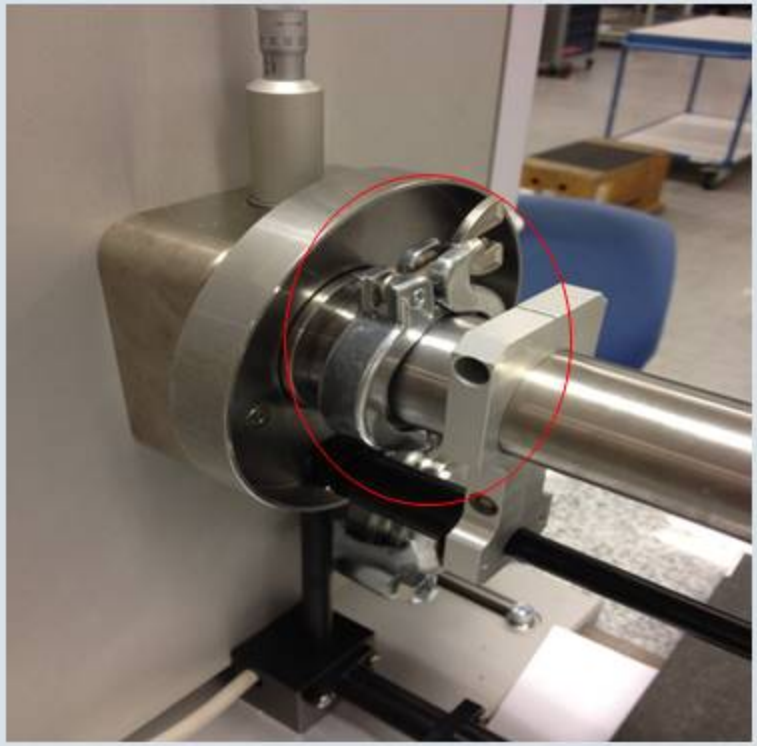


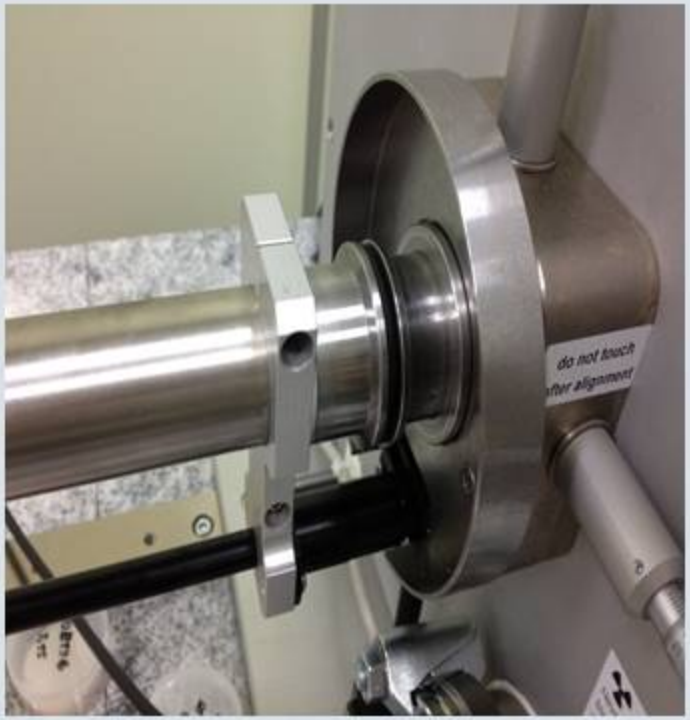
將4顆螺絲放鬆，但不完全鬆掉

手握在這，然後往左拉



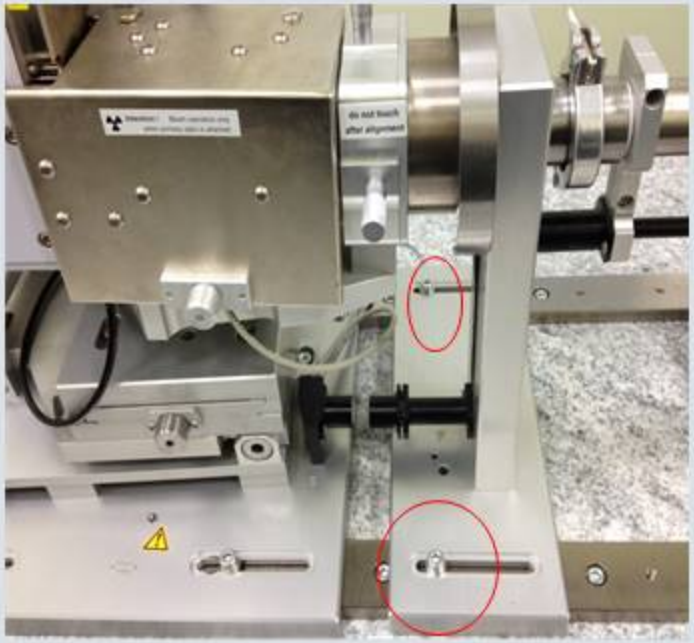
七、安裝真空屏蔽配件-step2



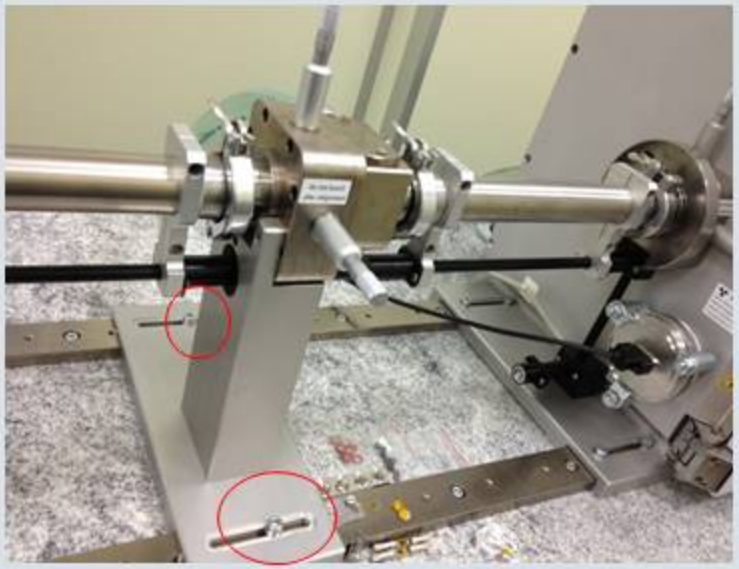


將Clamp移開

七、安裝真空屏蔽配件-step3

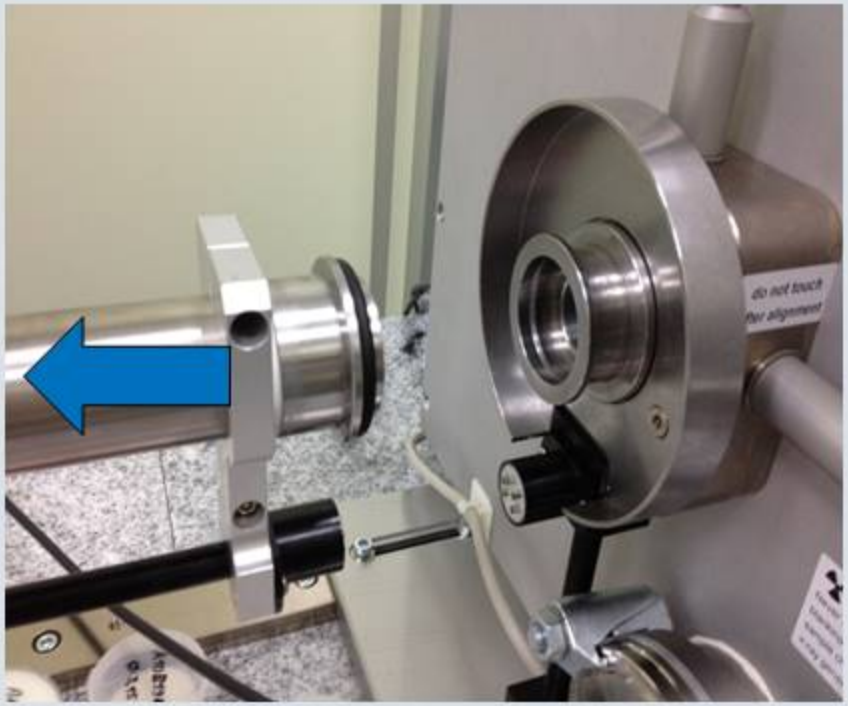


螺絲放鬆，但不鬆脫



此組螺絲須完全鬆脫

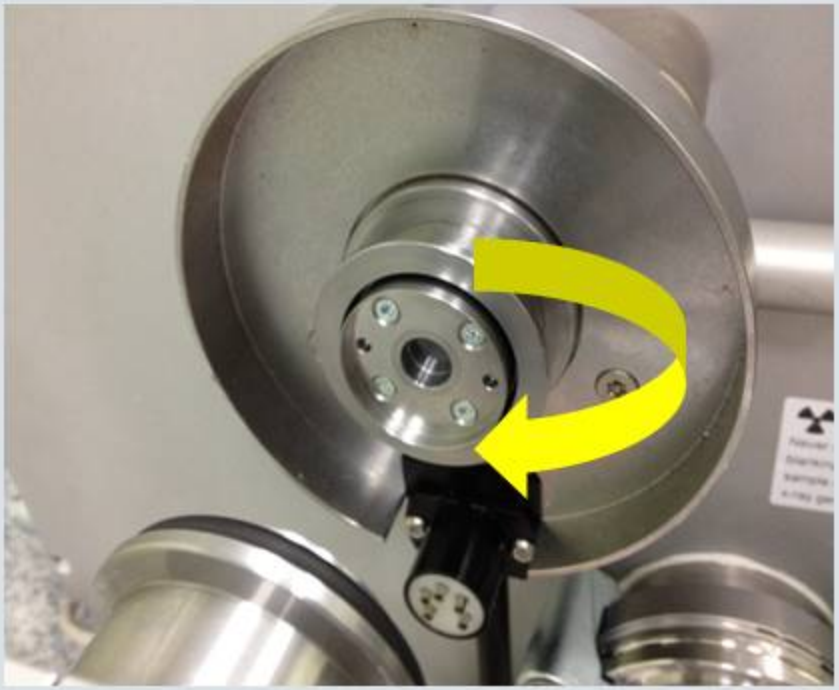
七、安裝真空屏蔽配件-step4



1.將左邊的配件往左拉,讓兩個配件分離

2. 拿出第一端的真空屏蔽配件

七、安裝真空屏蔽配件-step5

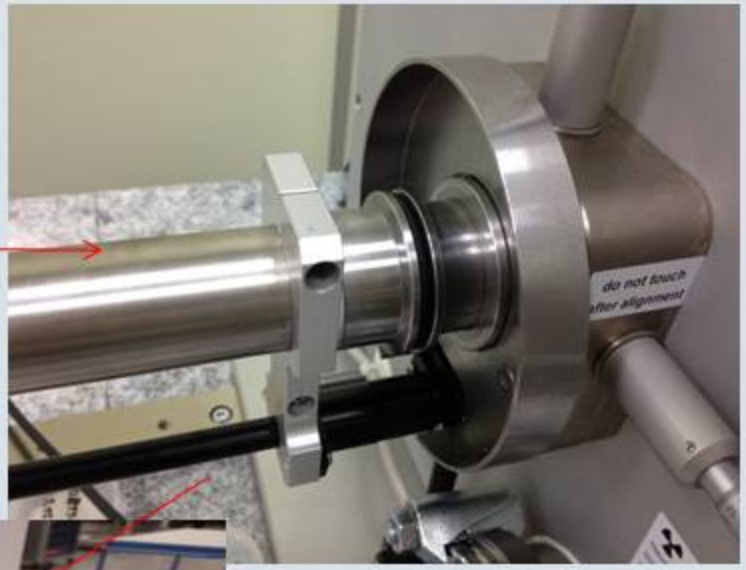


1. 用手將此配件順時針鎖入

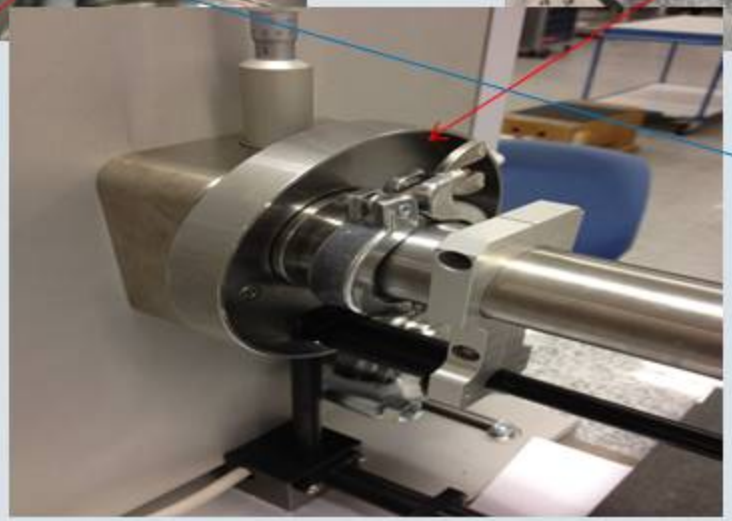
2. 利用黑色的工具將此配件完全鎖緊，(因為有o-ring在裡面所以需要使出較大的力量)

七、安裝真空屏蔽配件-step6

1. 真空屏蔽配件鎖緊後

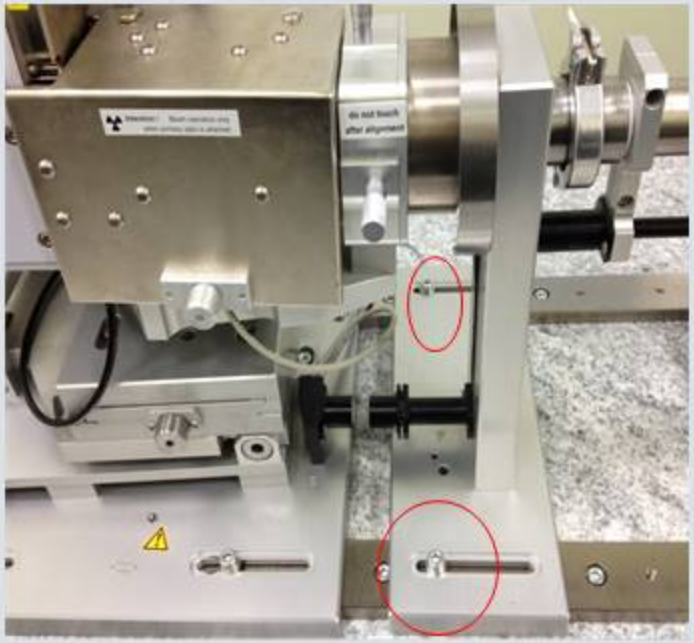


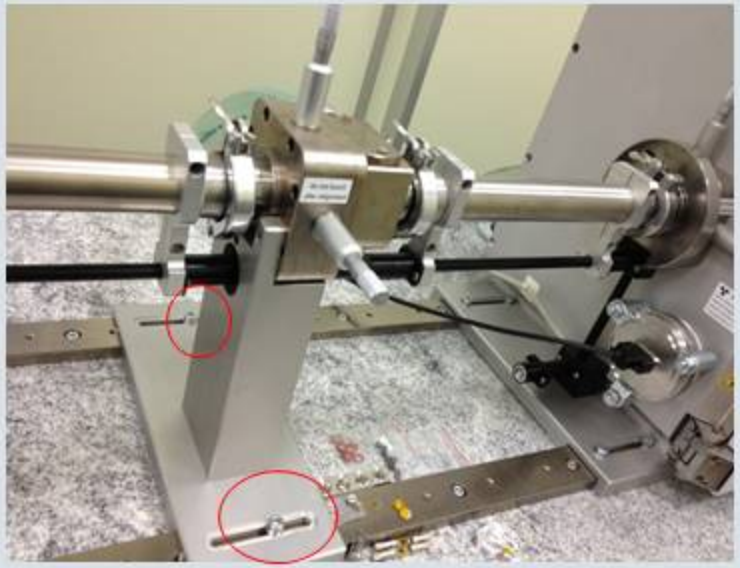
2. 將兩個配件組合，組合時小心安全迴路的Pin腳



3. 將clamp鎖好

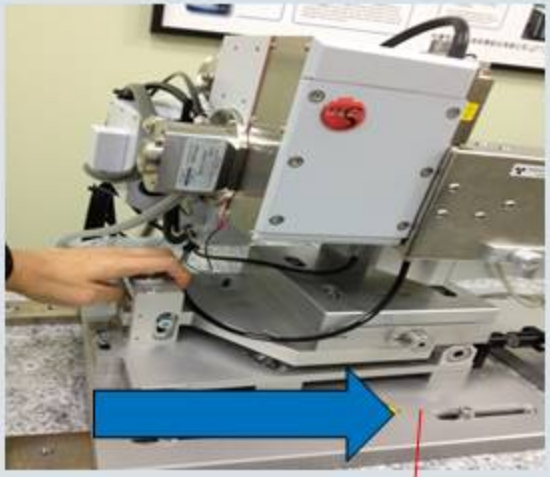
七、安裝真空屏蔽配件-step7





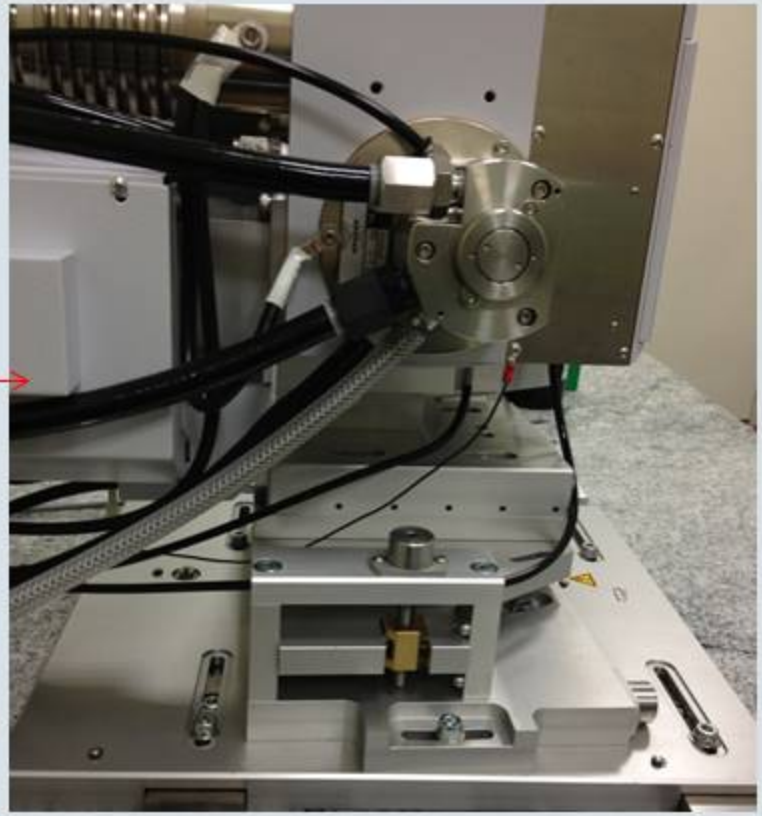
將螺絲鎖緊

七、安裝真空屏蔽配件-step8

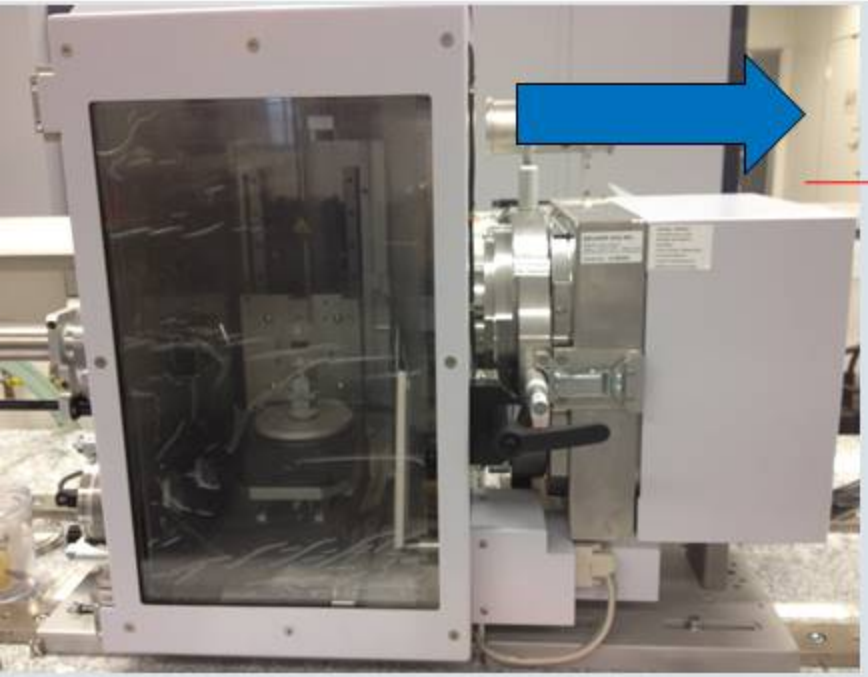


手握這裡往右推

組合，小心
pin腳



七、安裝真空屏蔽配件-step9

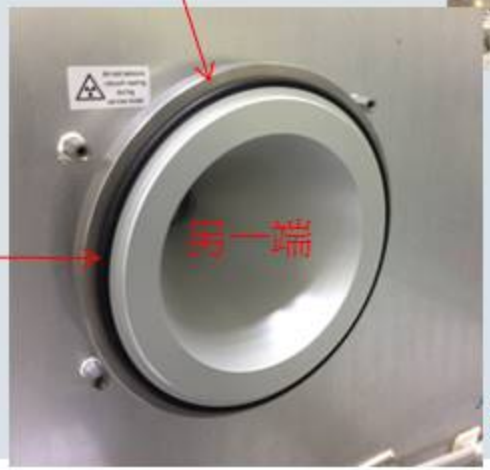


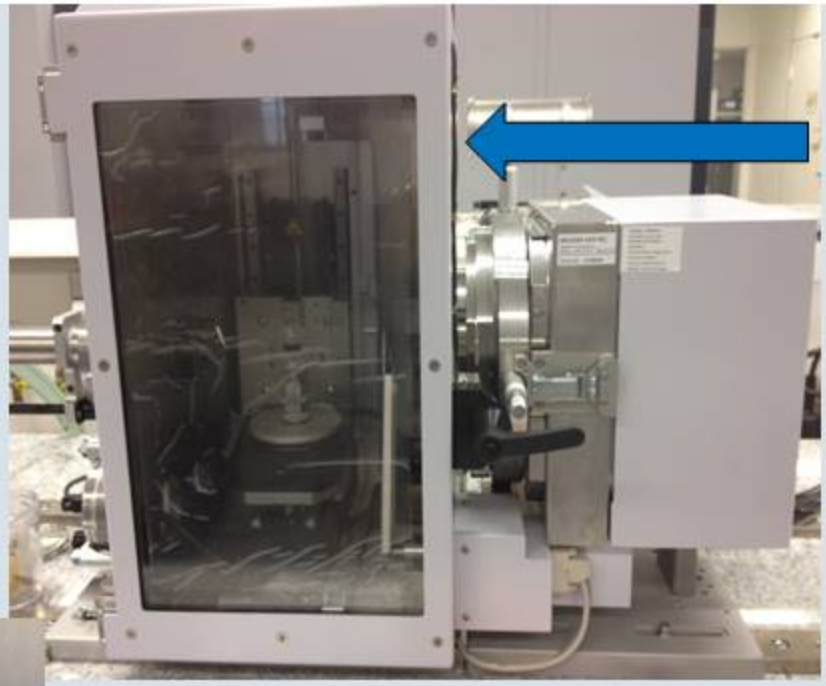
1. 先將螺絲完全放鬆然後將Detector 往後推

2. 將此adapter取下

七、安裝真空屏蔽配件-step10

1. 將第二端的真空屏蔽配件插入
2. 注意另一端的o-ring必須放置

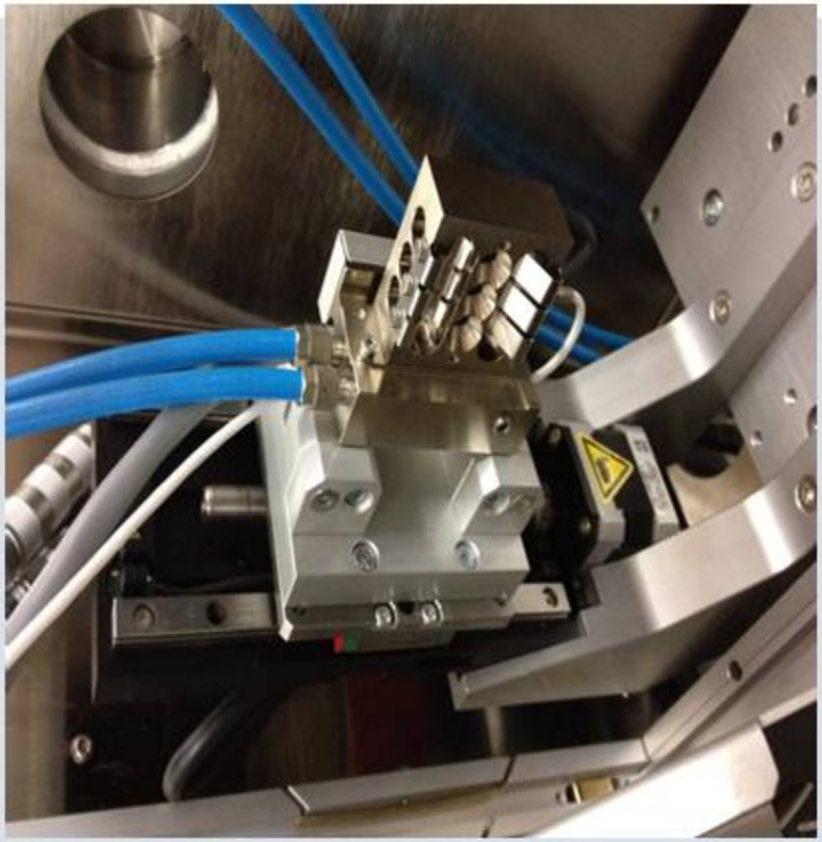




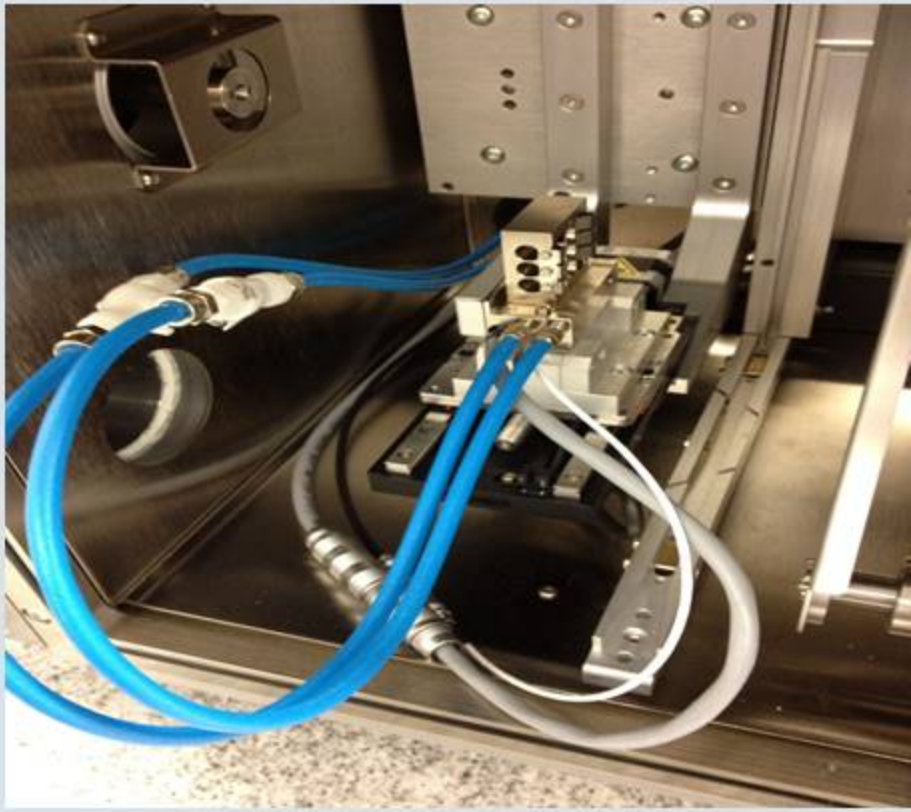
2. 再將Detector推入然後將螺絲鎖緊

※打開X-Ray，請參閱點燃X-Ray步驟

八、安裝高溫配件-step1



1. 將高溫配件放置樣品載台



2. 如圖片所示，將入、回水接頭、高溫加熱電線及溫度感測接好。(總共有四個接頭要連接)

八、安裝高溫配件-step2

1. 按壓Main Switch 去開啟高溫控制器

Pa= Page
Sc= Scroll
D= Down
U= Up

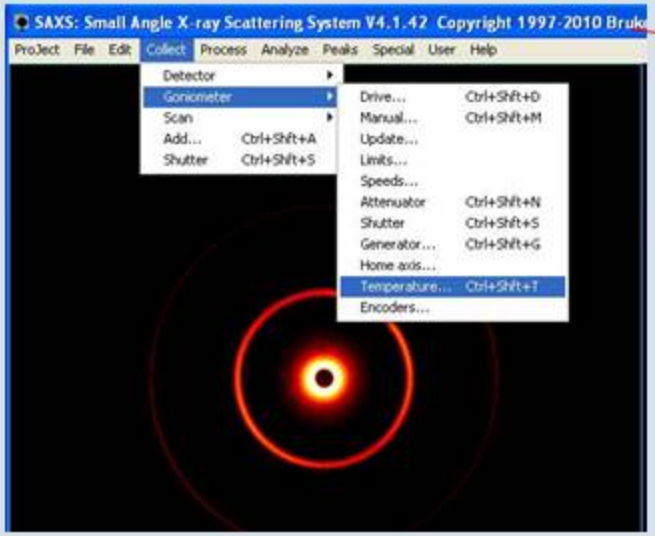
八、安裝高溫配件-step3

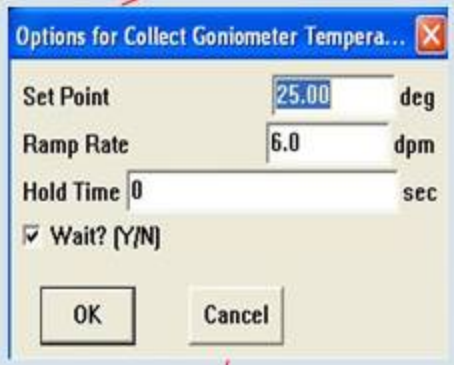
Param.	Air / Vac.
Pb	29/ 68
Ti	59/ 735
Td	9/ 122
Lcb	46/ 108
Hcb	46/ 108

2. 在控制器開啟但加熱開關為關閉的狀態下，按Page 4次會看到 “ Pid List”
3. 按 Scroll 依序去更改如右圖的參數
4. 參數更改完畢，在按壓Page 1次回到主畫面

八、安裝高溫配件-SAXS Program

1. Collect > Goniometer> Temperature
2. 在“Set Point”的地方輸入溫度(ramp rate 最大為6 dpm，Hold Time 為要持溫多久的時間，Wait如果有打勾，SAXS會執行升溫控制直到設定溫度到達後歸還控制權(可利用鍵盤的“Enter”取消)，如果Wait沒打勾則立即歸還控制權
3. Temp：現在的溫度 ，SetTemp：你設定的溫度，Hold：要持溫多久





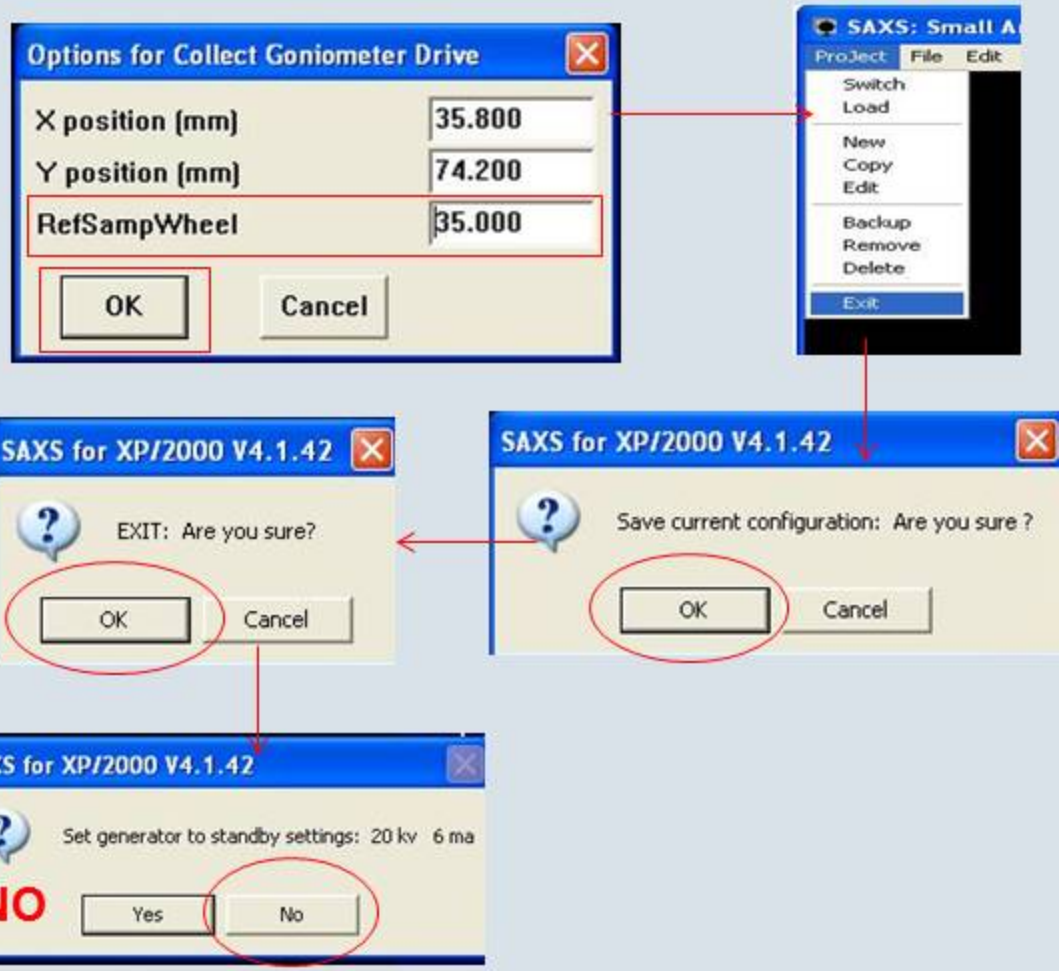
九、Daily check

1. 開機前先確認外部循環水機的水位，在冰水機的左方面板下面，必須在高低水位之間

2. 使用前後都確認水封的水箱是否有水，如有水，立即將機器關機(請參照關機步驟)，並與Bruker工程師聯絡

九、Daily check-利用GC校正HV Plot

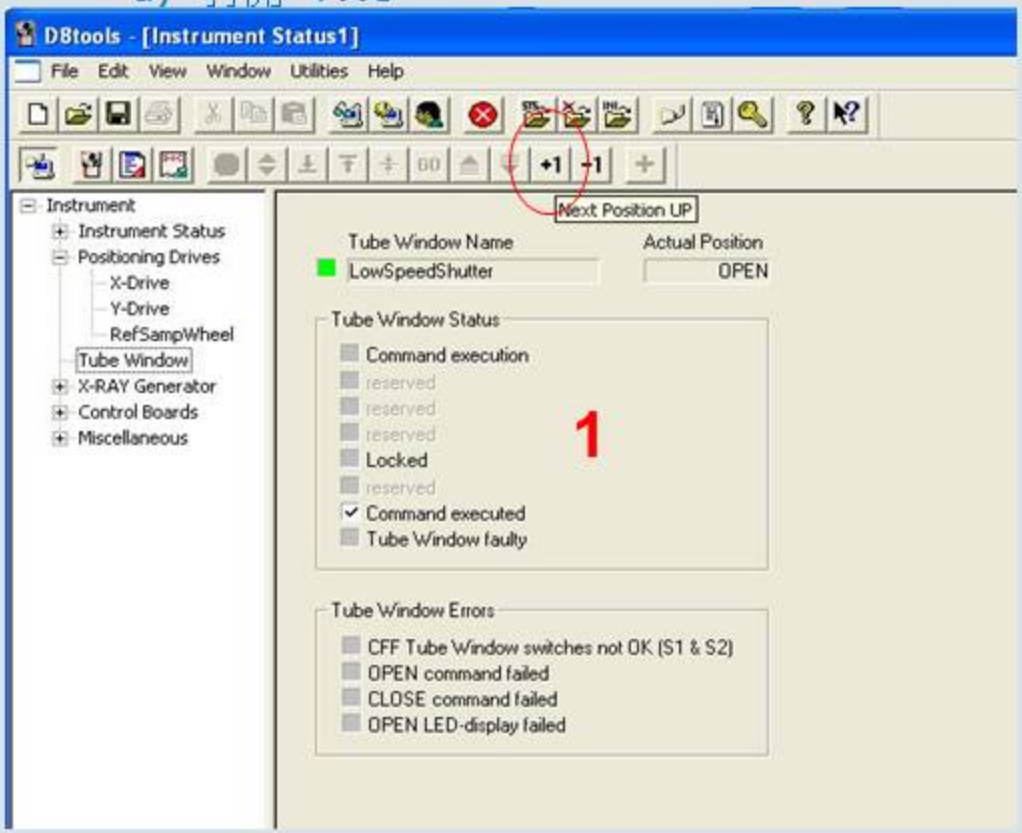
3. 利用GC校正HV Plot
   a) 利用saxs軟體的drive將"RefSampWheel移到"35"
   b) 關閉SAXS軟體



九、Daily check-利用GC校正HV Plot

c) 利用D8Tools 打開shutter—D8Tools>Online Status>Online refresh on/off >Instrument>Tube Window > +1(open shutter) ※-1(close shutter)

d) 打開 "PXC"

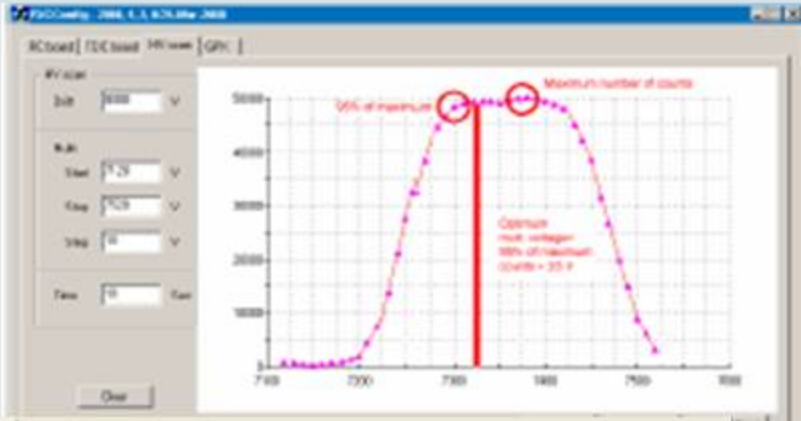


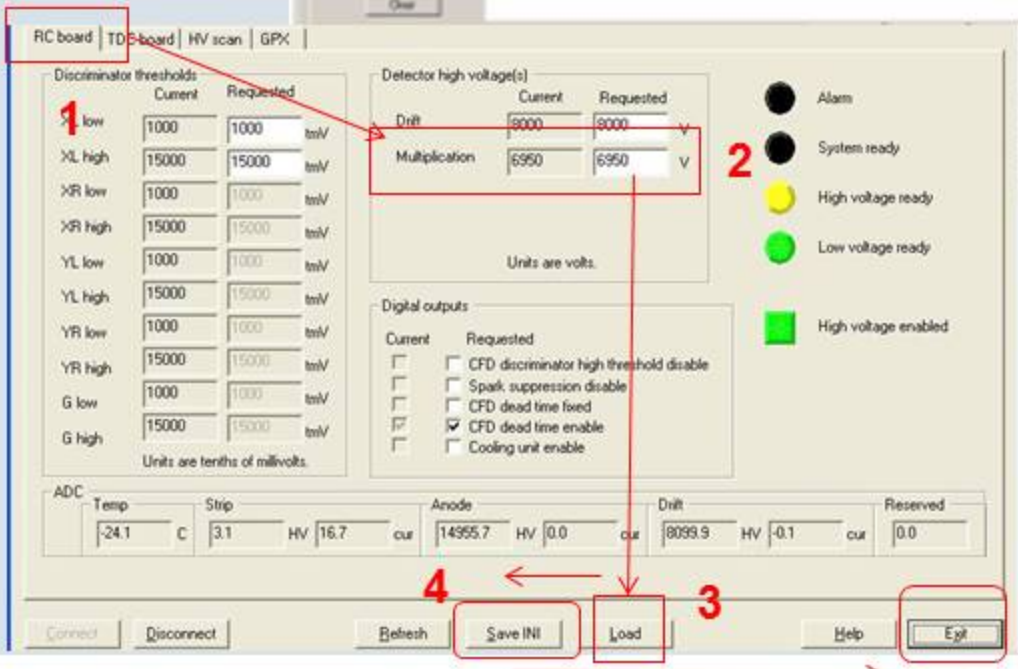
九、Daily check-利用GC校正HV Plot

d. 切換到HV scan 的頁面然後執行"Start"

九、Daily check-利用GC校正HV Plot

e) 量測結束後，紀錄最高強度，接著計算可使用的HV(最高強度X95%+25V)
f) 切換回去"RC board"
g) 將可使用的HV數值輸"入至"Multiplication
h) 點選"Load"
i) 點選"Save INI"
j) 點選"Exit"

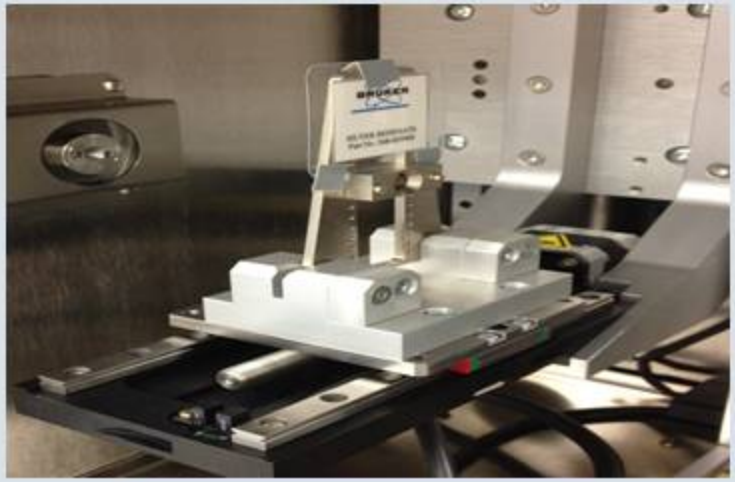




Bruker AXS

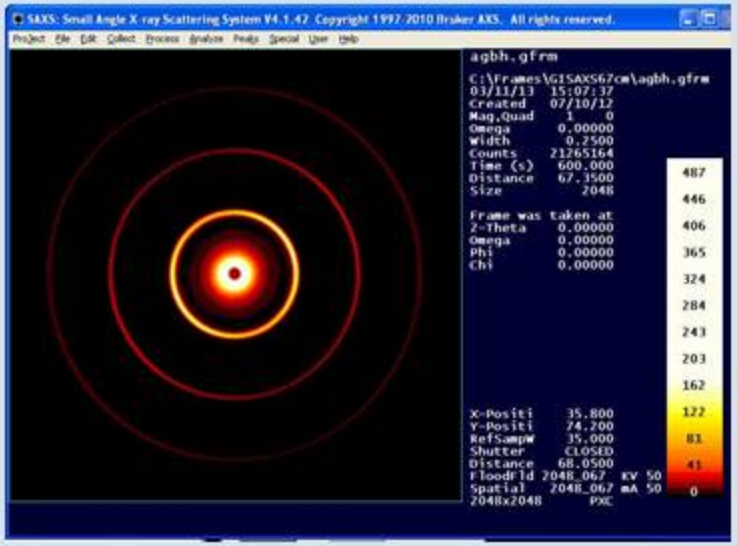
九、Daily check- 利用AgBh校正

4. 利用標準片AgBh校正X,Y center及Distance
   a) 將AgBh固定在樣品載台上(如右圖)
   b) 利用saxs軟體的drive將AgBh移動到讓X光源能完全穿透的位置，RefSampWheel要移到15
   c) 設定量測的條件，如100秒，然後開始量測



九、Daily check- 利用AgBh校正

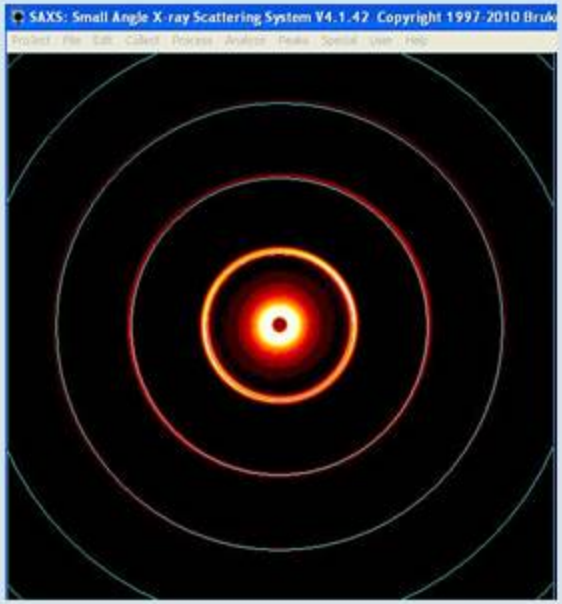
d) 量測結束後，記得利用Unwarp存檔

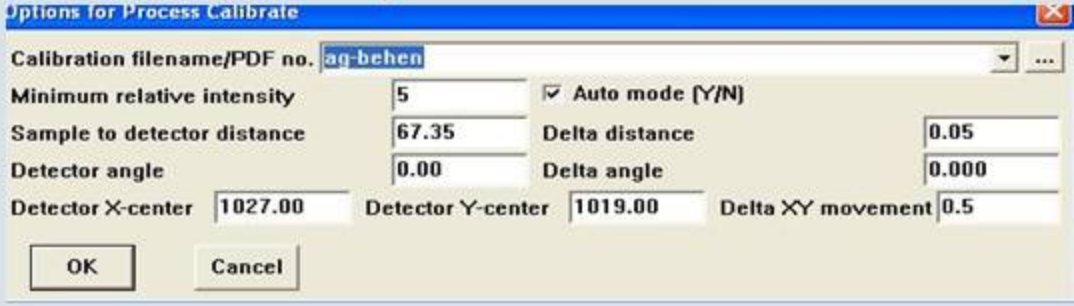


九、Daily check- 利用AgBh校正

e) 選擇"Process">"Calibrate"

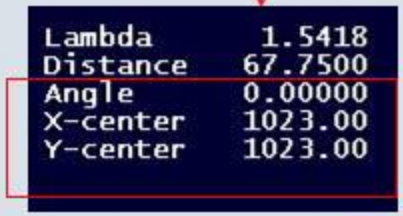
f) Auto mode要打勾，然後按"ok"，軟體會自動校正

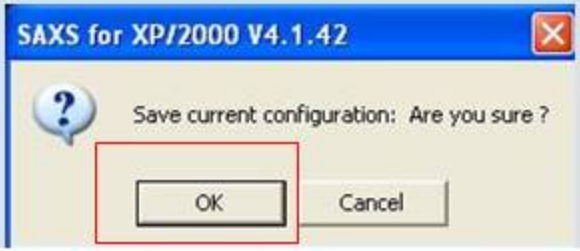




九、Daily check- 利用AgBh校正

g) 按鍵盤上的"Enter"，軟體會詢問是否要更新，選擇"Yes"
h) 重複 e) 到 g)的步驟N次，直到X-Center及Y-Center不再跳動
i) 點選"Project">"Exit"
j) 選擇Save current configuration
k) 不要離開

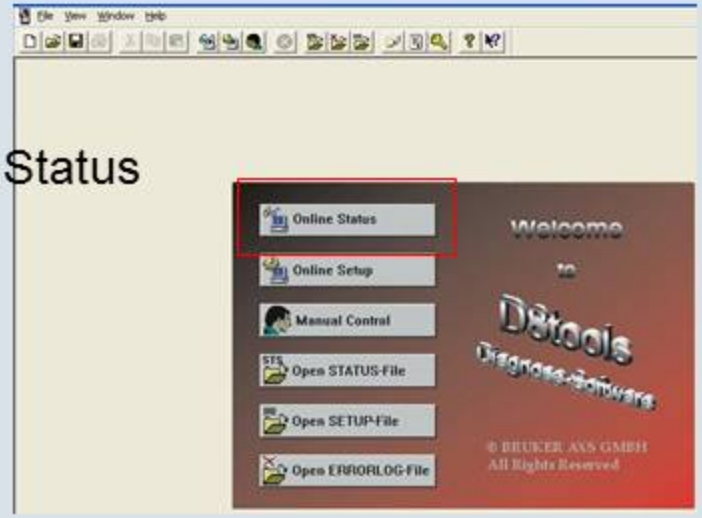




十、Trouble shooting-Reset TXSx Alarm

1. 在桌面上開起D8tools軟體

2. 選擇Online Status

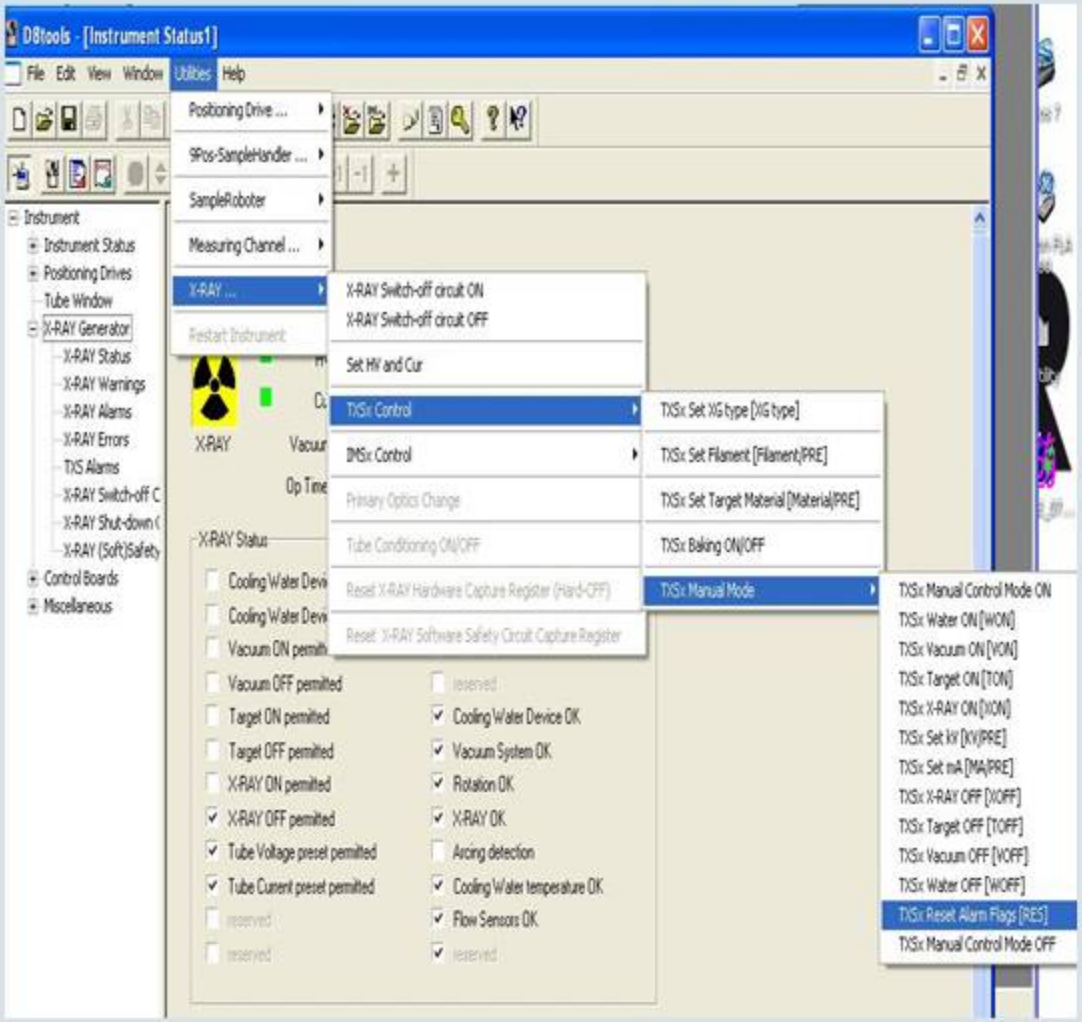


3. 壓下左上角的符號“ Online Refresh On/Off

4. 讀取儀器資訊後，顯示如右圖

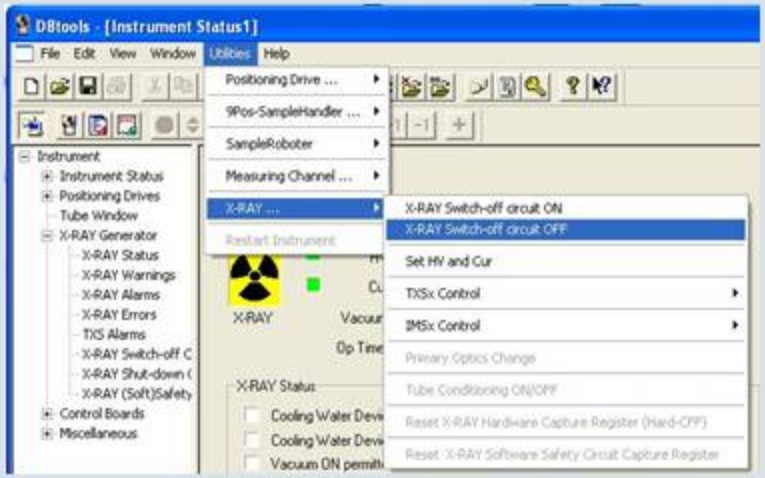
十、Trouble shooting-Reset TXSx Alarm

1. Utilities>X-Ray>TXSx Control>TXSx Manual Mode> TXSx Reset Alarm

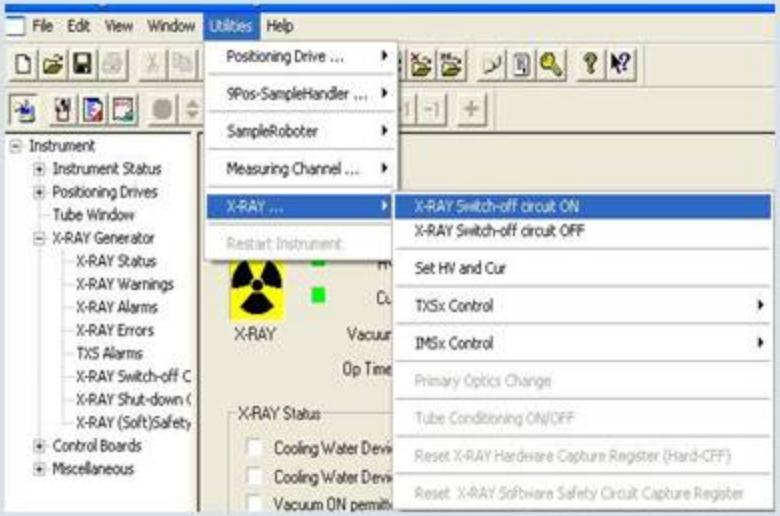


十、Trouble shooting-Reset TXSx Alarm

2. Utilities > X-RAY > X-Ray Switch off Circuit Off

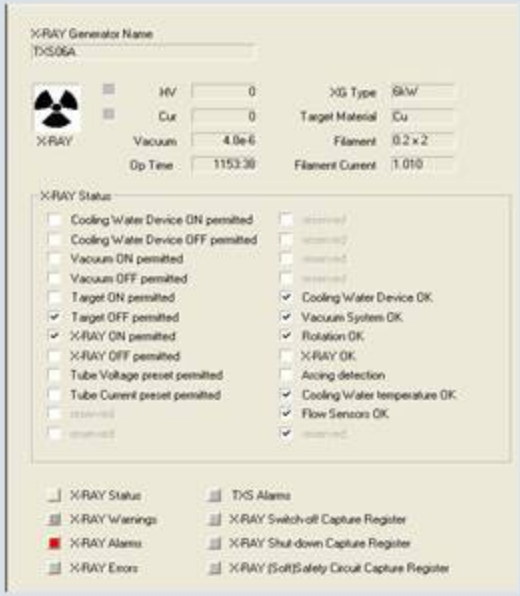


3. Utilities > X-RAY > X-Ray Switch off Circuit On



十、Trouble shooting-Reset TXSx Alarm

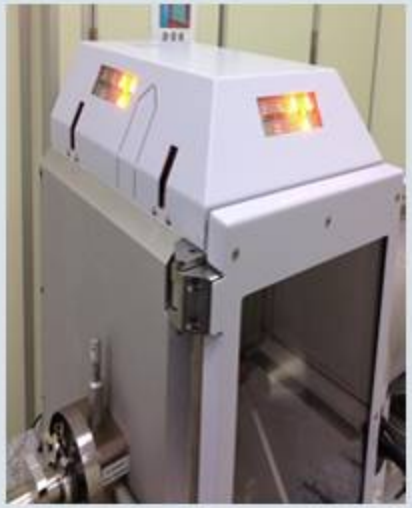
聽到Anode高頻的轉動聲音，然後真空值低於1.0e^{-6}就能開啟高壓



順時針旋轉高壓旋鈕3秒以上開啟X-Ray

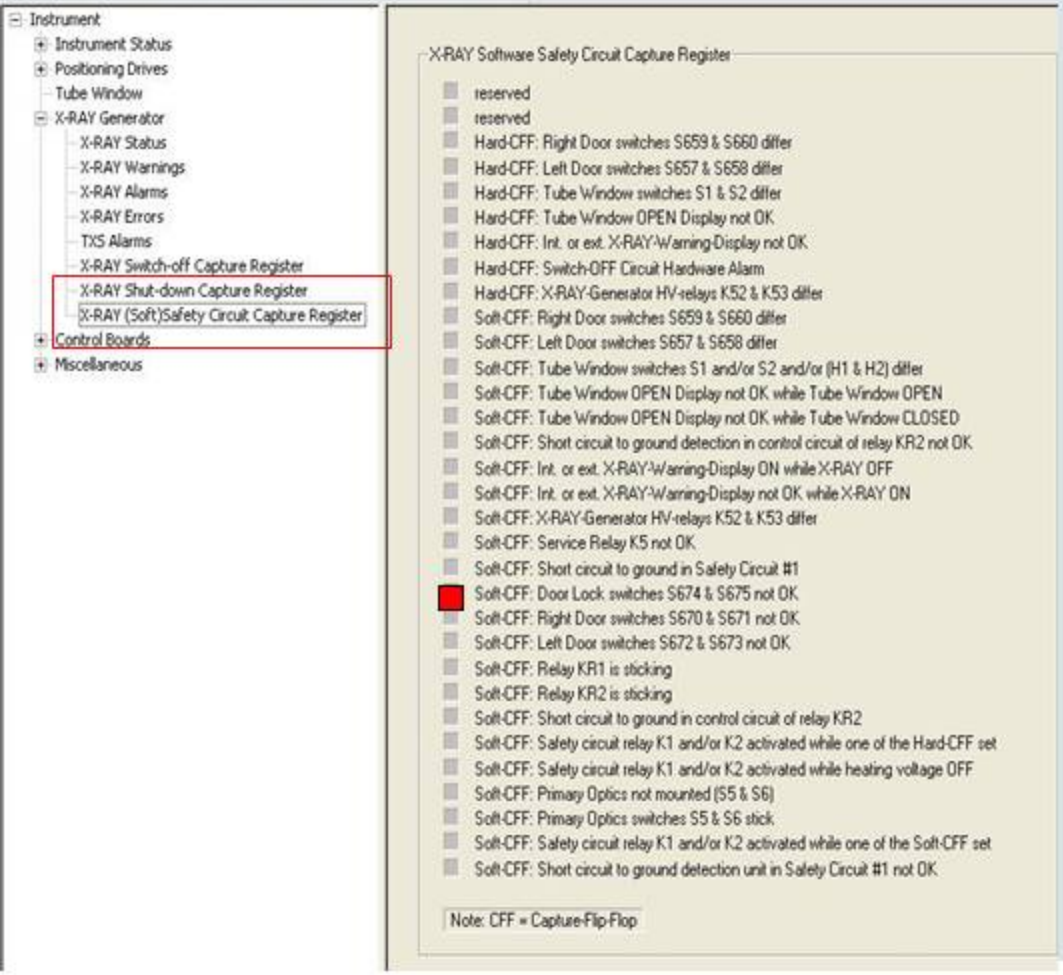
X-Ray開啟後，Ready及On會亮起

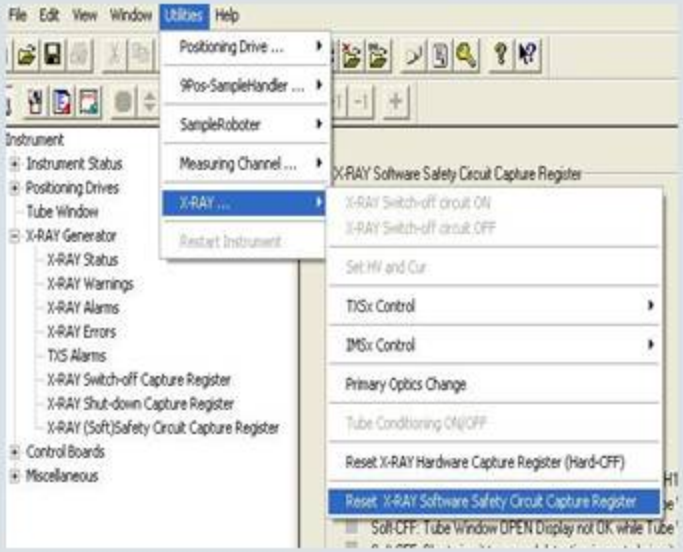
Chamber上方的X-Ray警示燈號也會亮起



十、Trouble shooting-Reset Nanostar Alarm

1. Instrument>X-Ray Generator>X-ray(soft) Safety Circuit
2. Utilities>X-Ray>Reset X-RAY Software

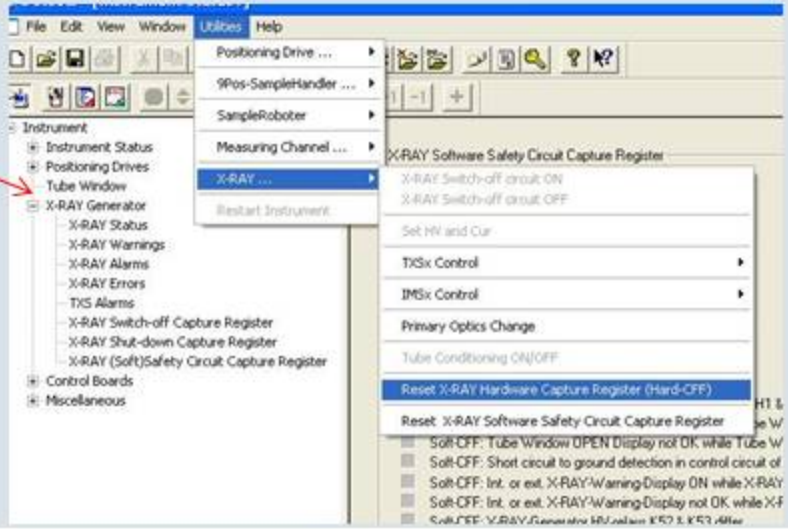




十、Trouble shooting-Reset Nanostar Alarm

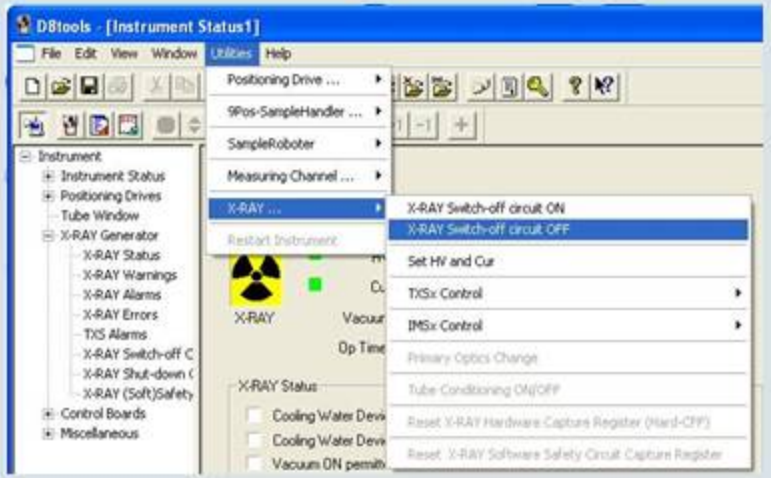
密碼為“ password”

3. 輸入密碼清除錯
4. Utilities> X-RAY>Reset X-RAY Hardware

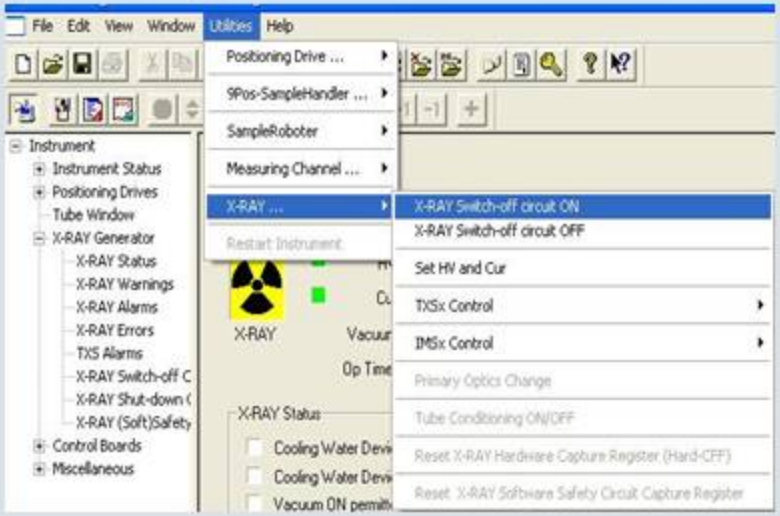


十、Trouble shooting-Reset Nanostar Alarm

2. Utilities > X-RAY > X-Ray Switch off Circuit Off

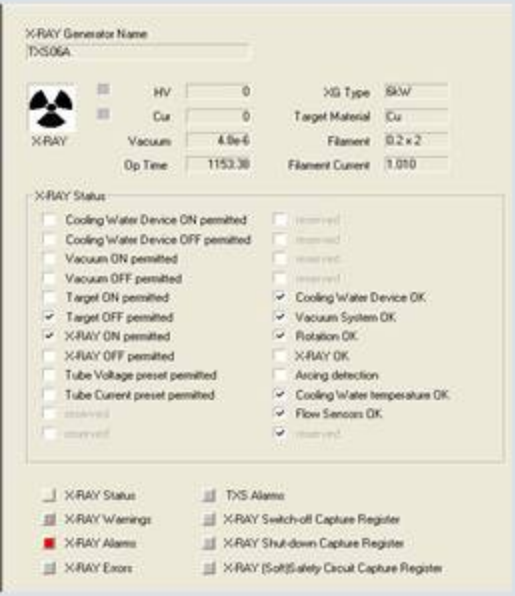


3. Utilities > X-RAY > X-Ray Switch off Circuit On



十、Trouble shooting-Reset Nanostar Alarm

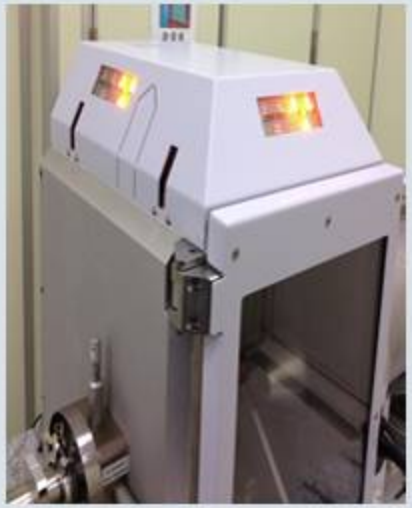
聽到Anode高頻的轉動聲音，然後真空值低於1.0e-6就能開啟高壓



順時針旋轉高壓旋鈕3秒以上開啟X-Ray

X-Ray開啟後，Ready及On會亮起

Chamber上方的X-Ray警示燈號也會亮起



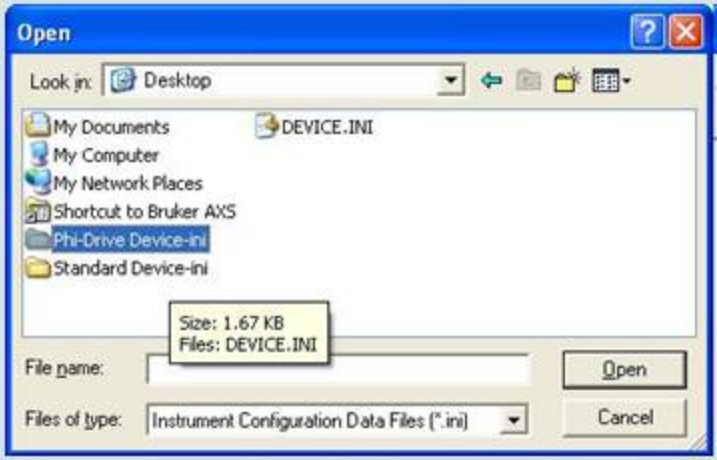
十一、SAXS Experiment

1. 在切換至SAXS的配置前，必須先將X光的主機關閉，請執行關機步驟到步驟8
2. 在更換不同偵測器距離(管長)前，必須先將X光的高壓關閉，請執行關機步驟到步驟6
3. 在執行量測前，一定要確定擺放樣品艙體的真空及X光路徑管路的真空開關已經開啟(要確定alarm的燈號閃爍)

十一、SAXS Experiment

1. 在桌面上點選 FileTransfer.exe

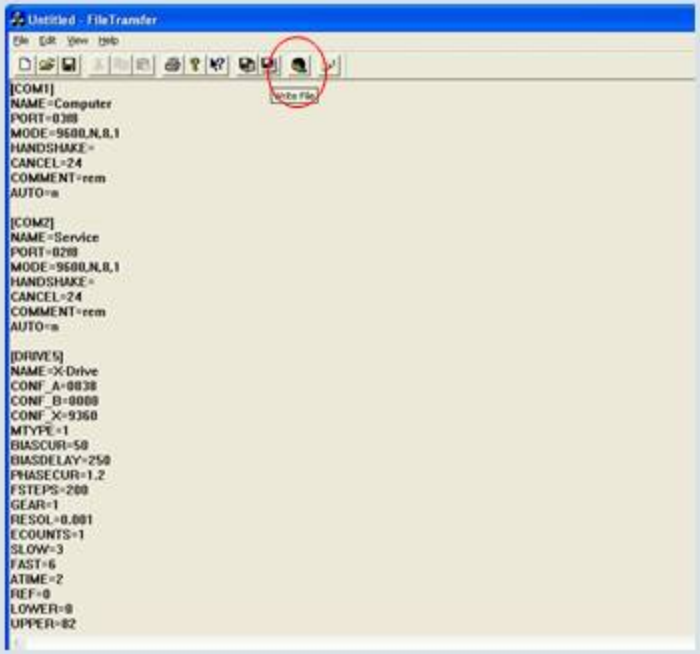
2. 選擇開啟



3. 桌面上有兩個關於系統參數切換的資料匣，內容物如名稱所示。

※Phi Drive：GISAXS使用
　Standard：SAXS 及溫控SAXS使用

十一、SAXS Experiment



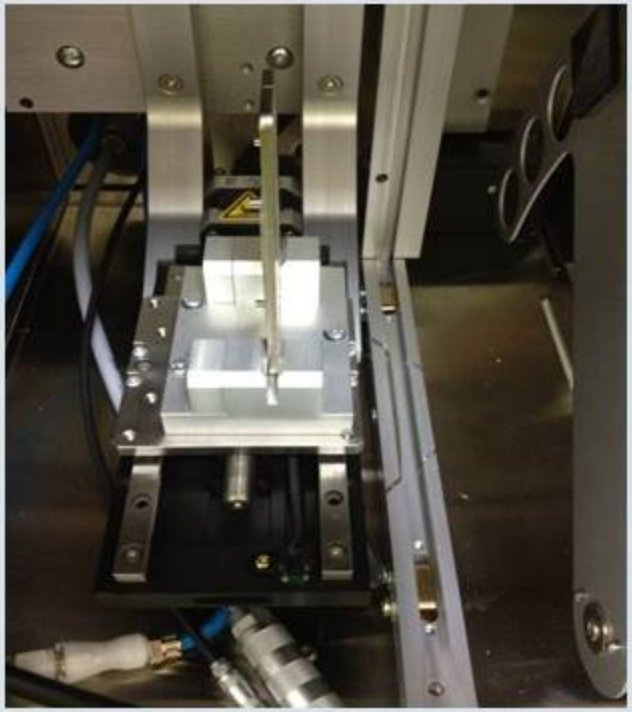
1. 系統參數打開後
2. 選擇 “Write File”

3. 選擇要更換的 “Device.ini”

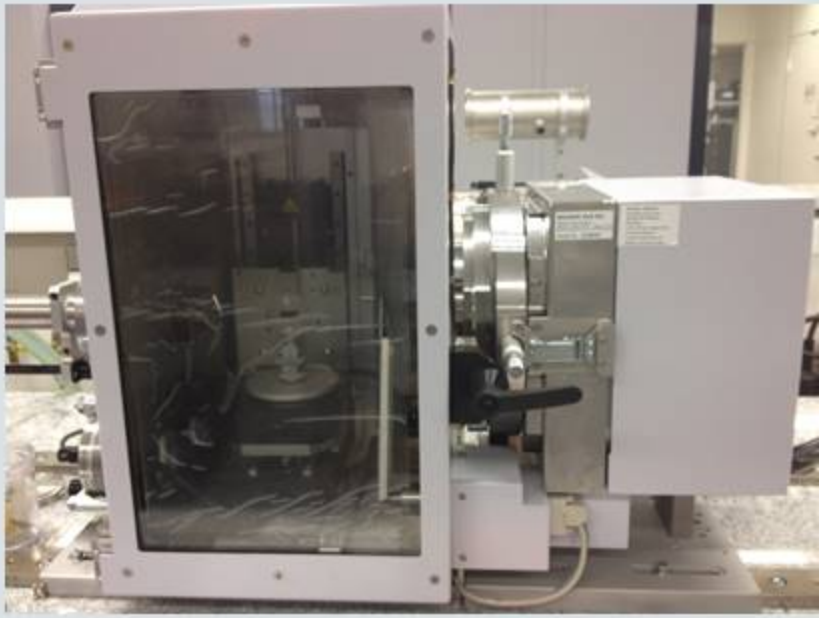
十一、SAXS Experiment

1. 依照關機步驟直到按“紅色O”的按鈕關掉系統儀器為止

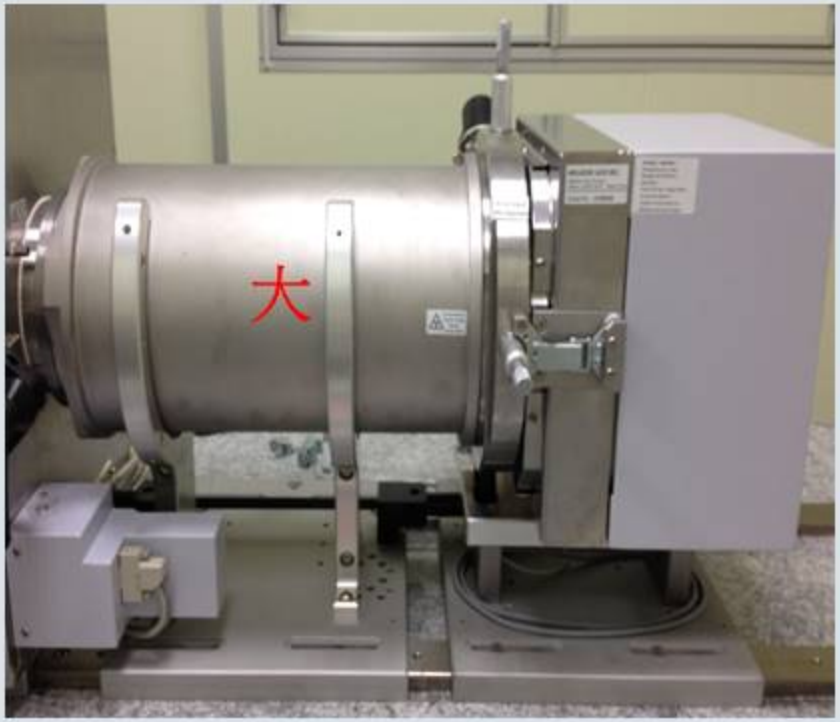
2. 安裝SAXS的樣品載台



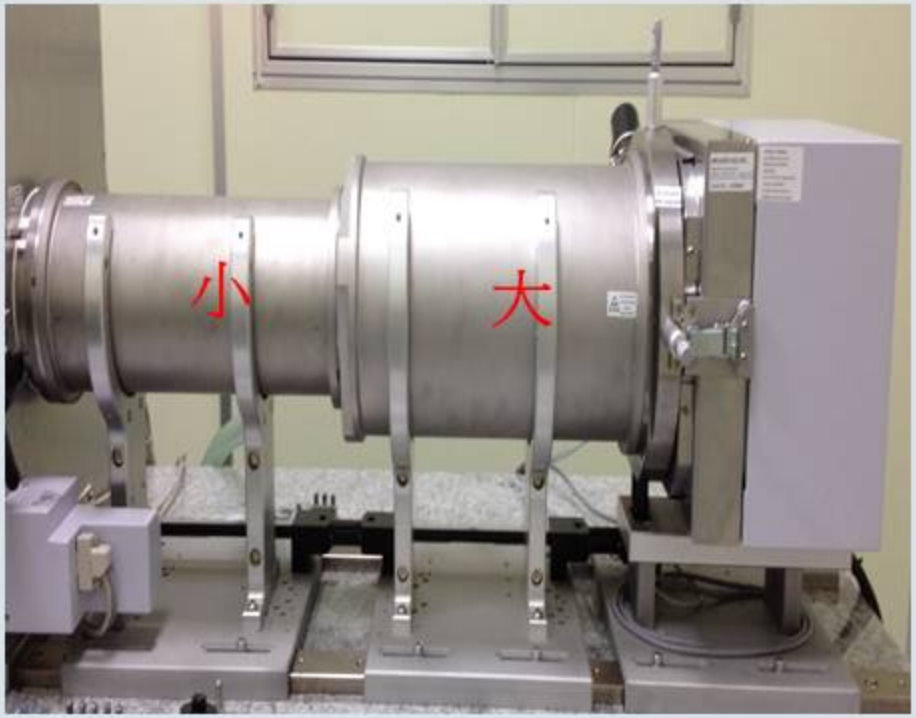
3. 移動Detector的位置，並將其固定



十一、SAXS Experiment



68cm



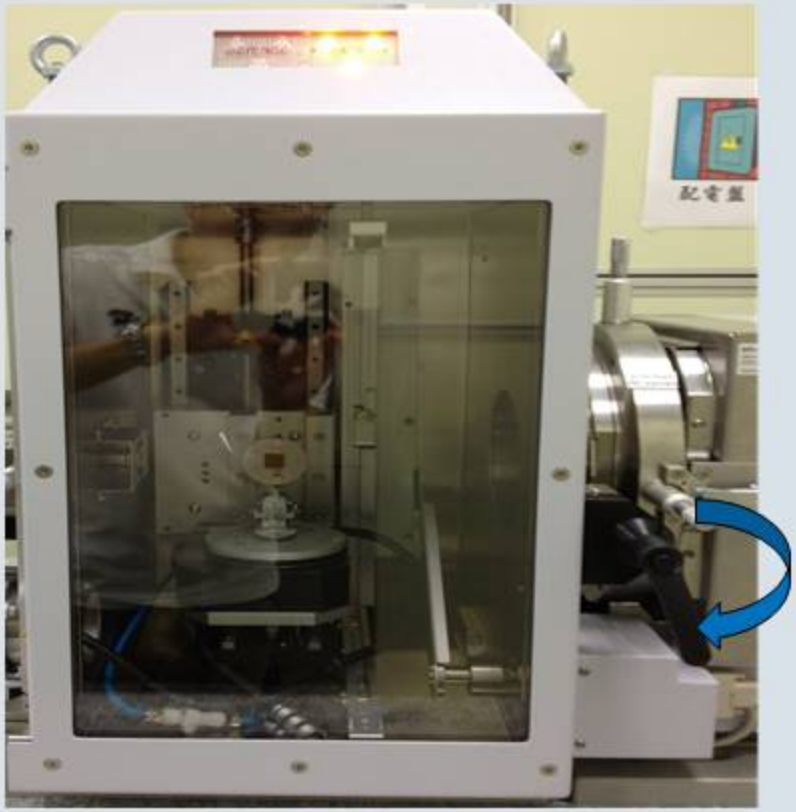
107cm

4.更換完管徑並確認Beam Stop也更換完畢後，請依照開機步驟7~28，執行開機動作直到電壓電流維持在50，50

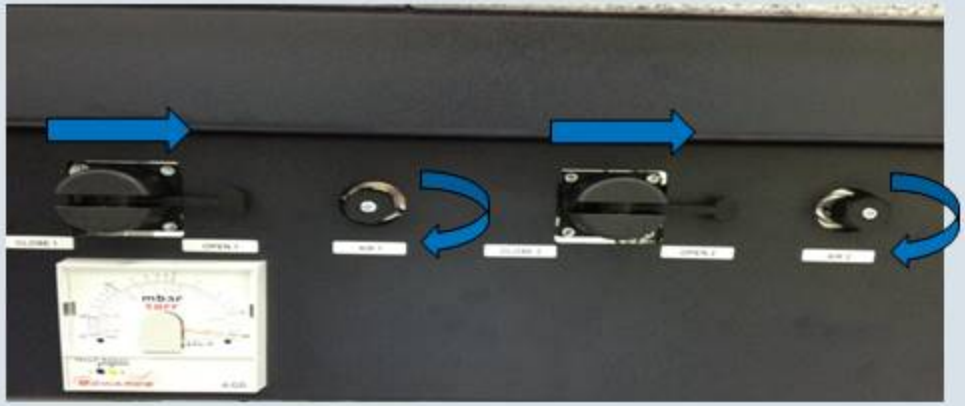
十一、SAXS Experiment

5. 利用夾具將樣品固定在支架上，樣品置中擺放

十一、SAXS Experiment



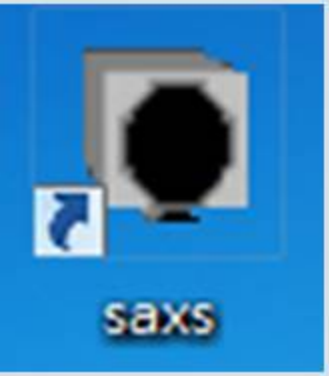
6. 將門往內推，然後順時針推把手將門鎖緊，鎖好後會聽到“咖”的聲音就完成



7. 將AIR1及AIR2順時針鎖緊，然後將CLOSE1和CLOSE2同時向右推到OPEN1和OPEN2

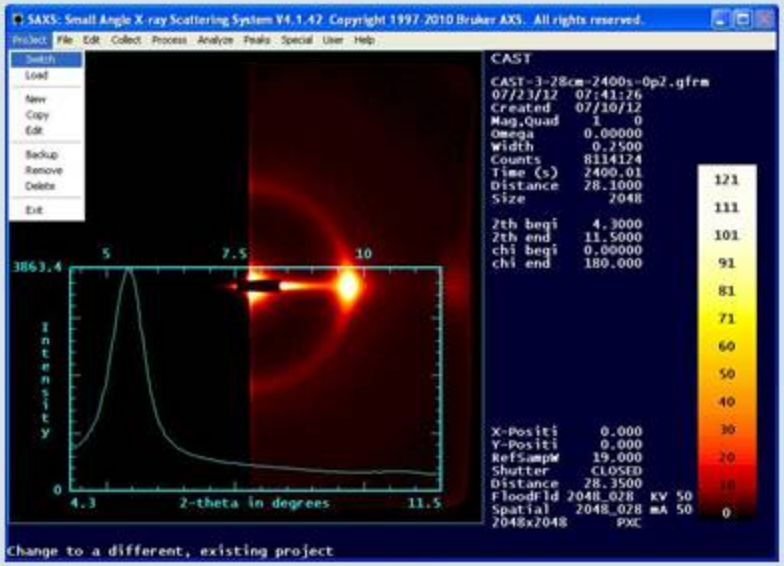
8. 比左圖還好的真空就能開始量測

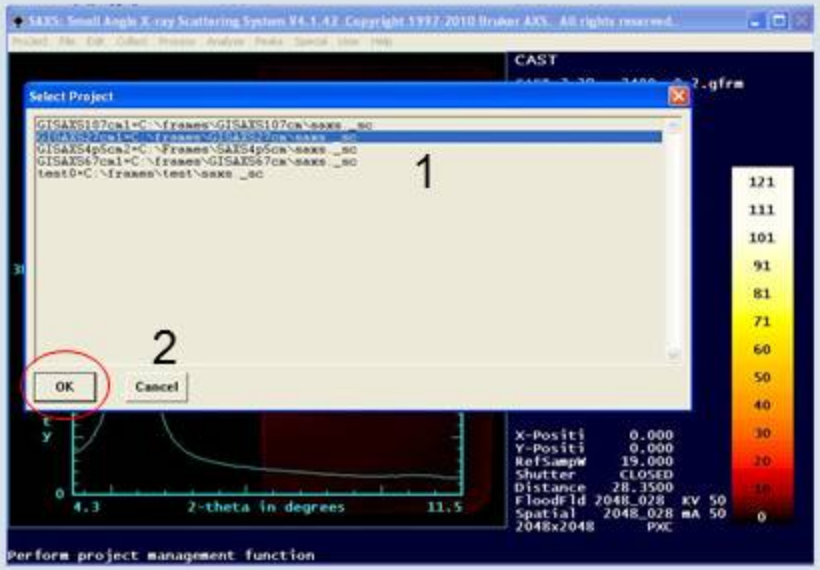
十一、SAXS Experiment



1. 在操作電腦的桌
面上打開 SAXS軟體

2. 切換到要做實驗的距離，目前有四個
距離可供SAXS使用
※107cm,68cm,27cm及4.5cm

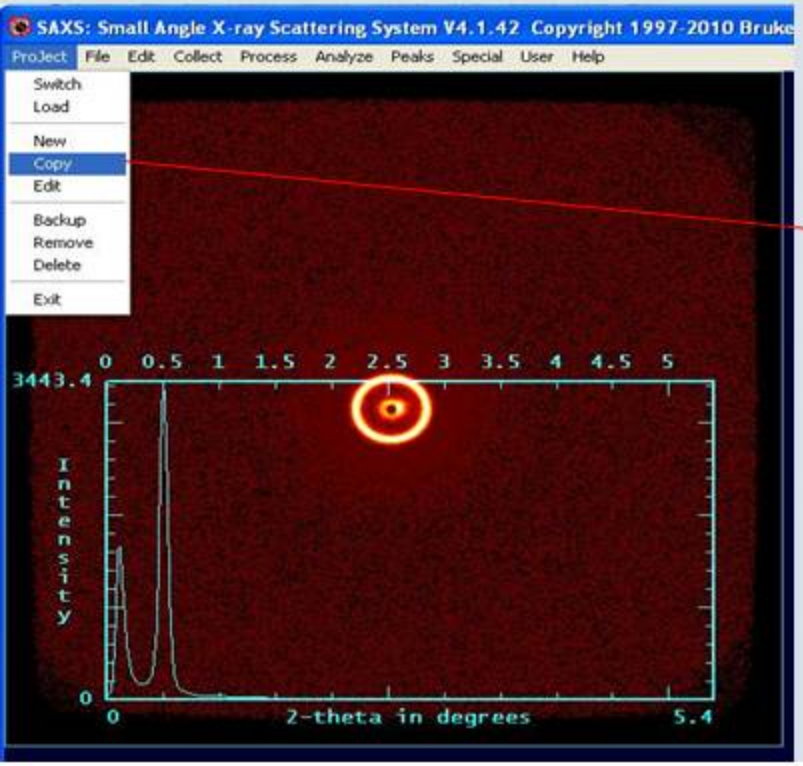




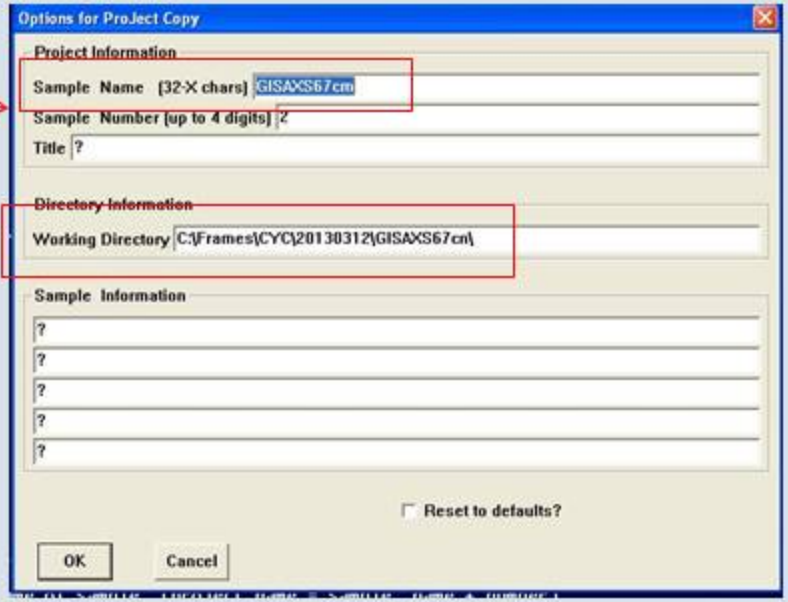
十一、SAXS Experiment

3. Copy目前的狀態

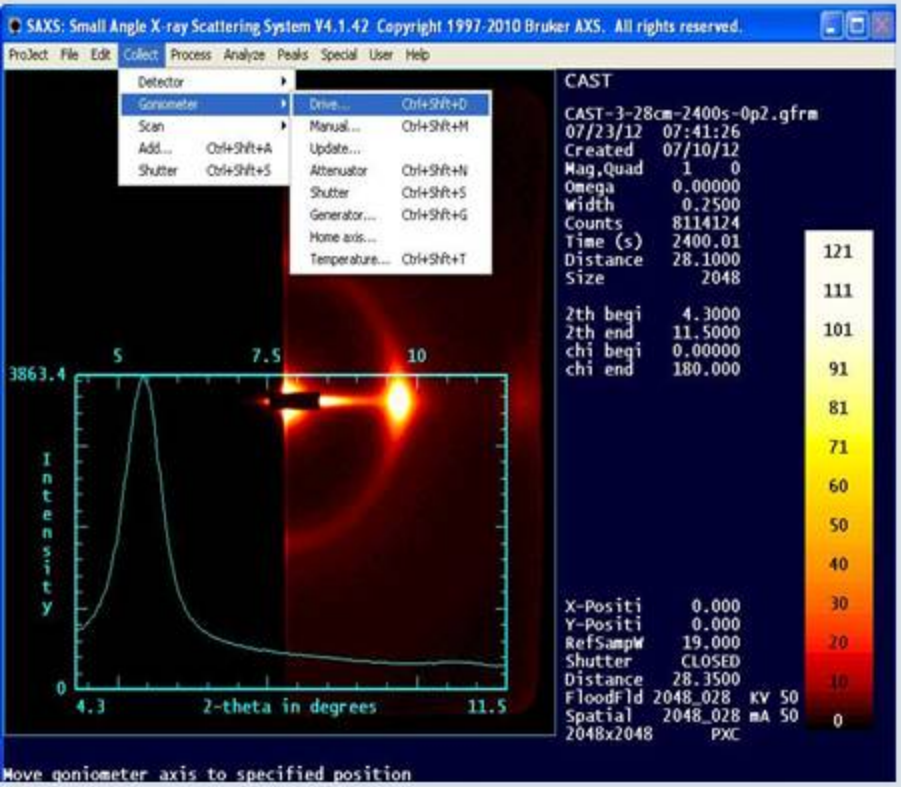
※此做法是為了不要覆蓋掉原始檔案的設定

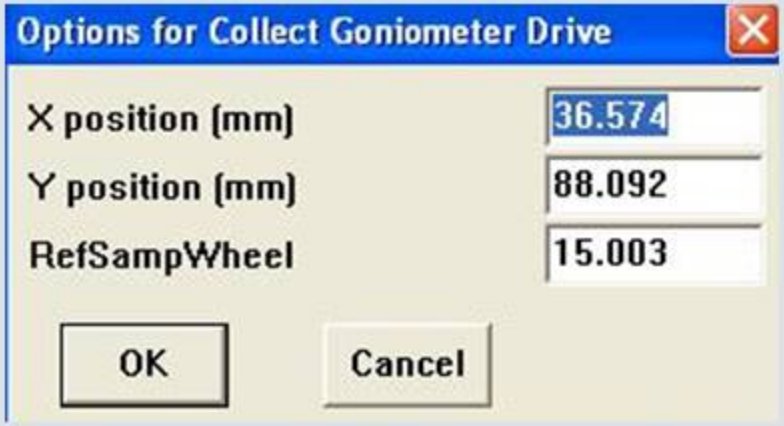


4. 在sample name輸入名稱及working directory輸入指定存檔的位置



十一、SAXS Experiment



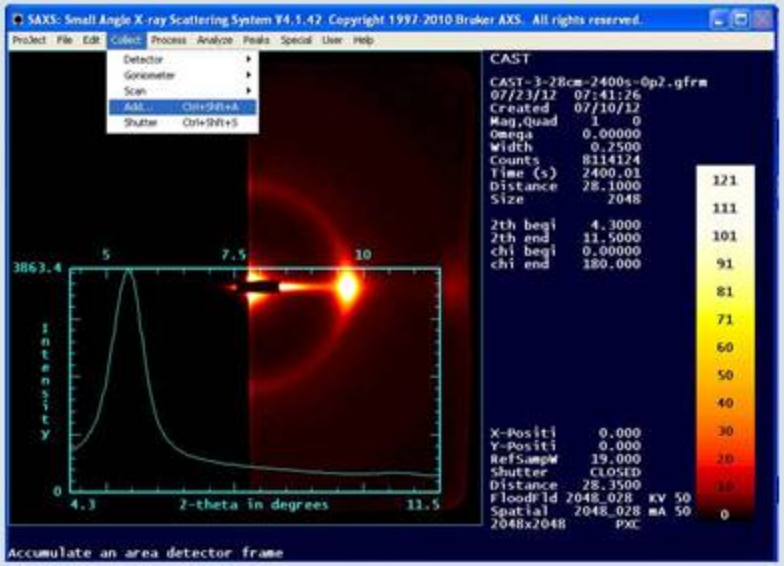


Collect~>Goniometer~>
Drive

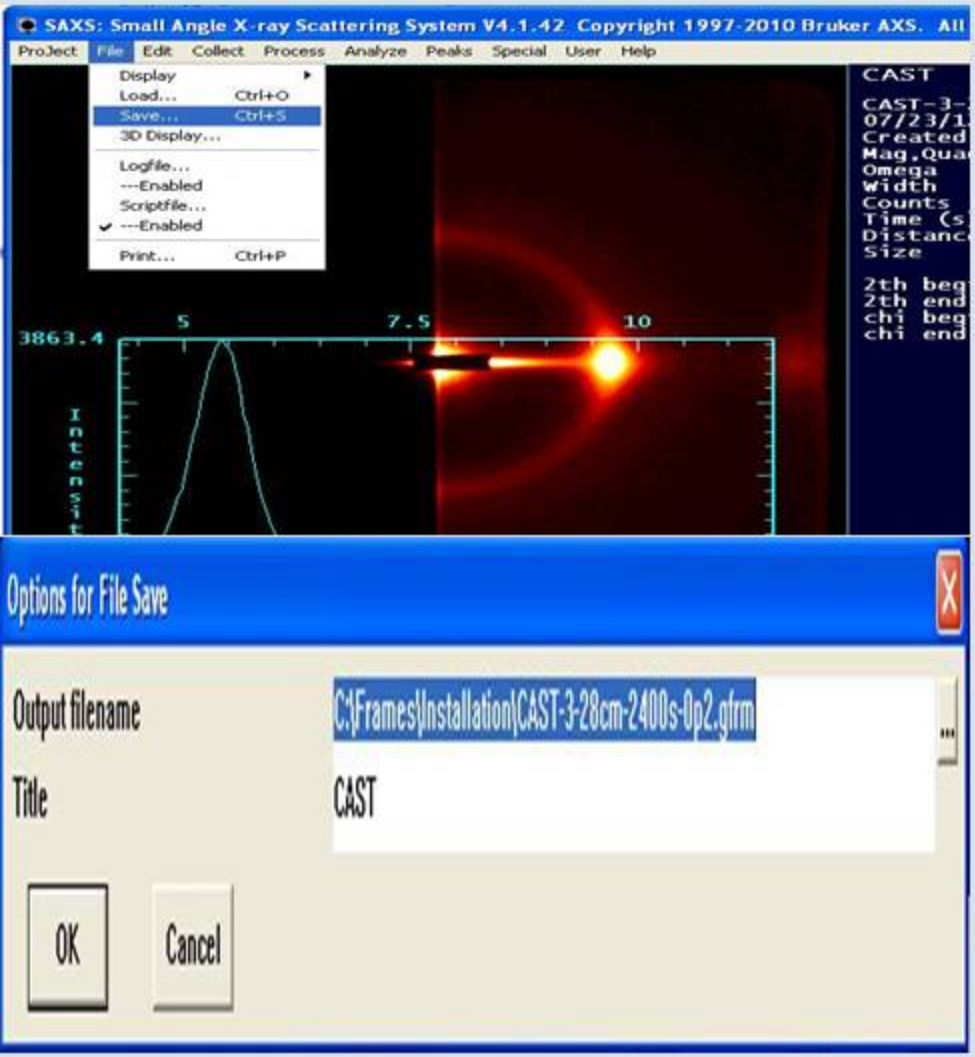
將所有的Axis設定跟上圖一樣

十一、SAXS Experiment

量測指令: Collect~>Add
※快捷鍵: Ctrl+Shift+A



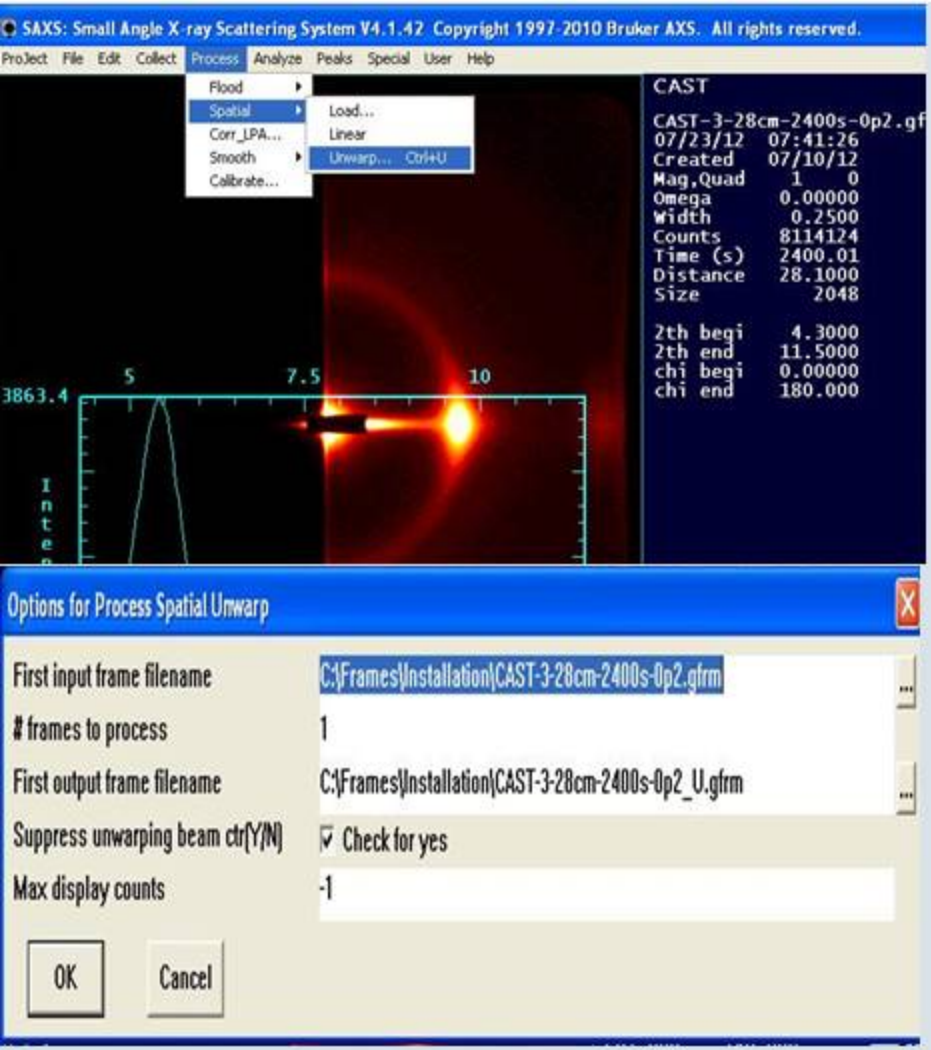
十一、SAXS Experiment



1. 量測結束後要存檔 :File>Save

2. 在Output filename裡選擇存放的路徑及名稱
3. 按“OK”

十一、SAXS Experiment

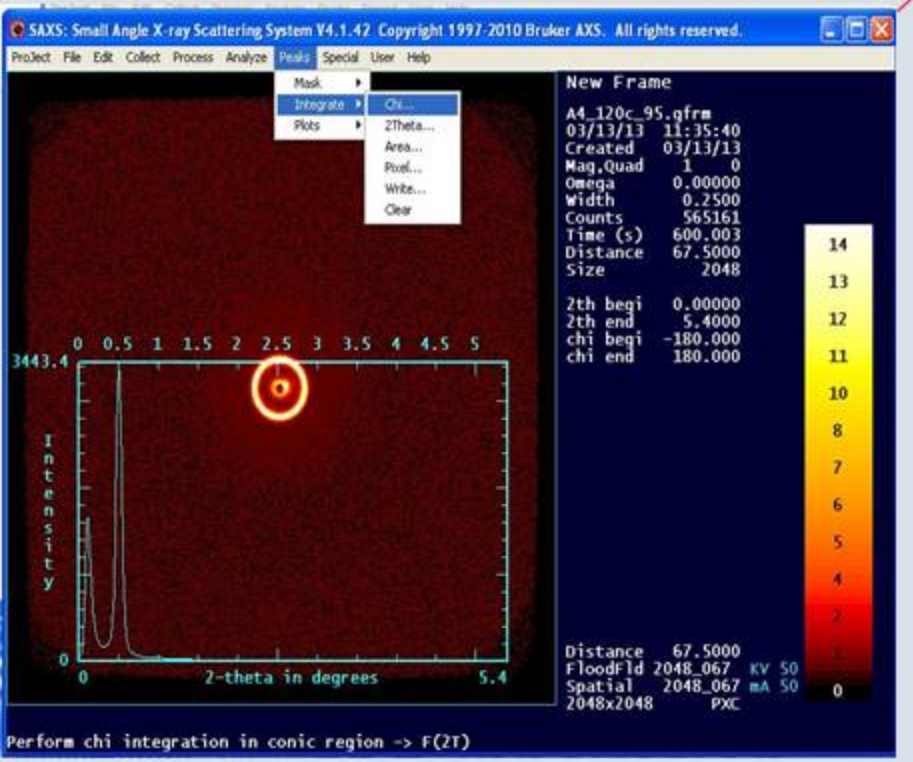


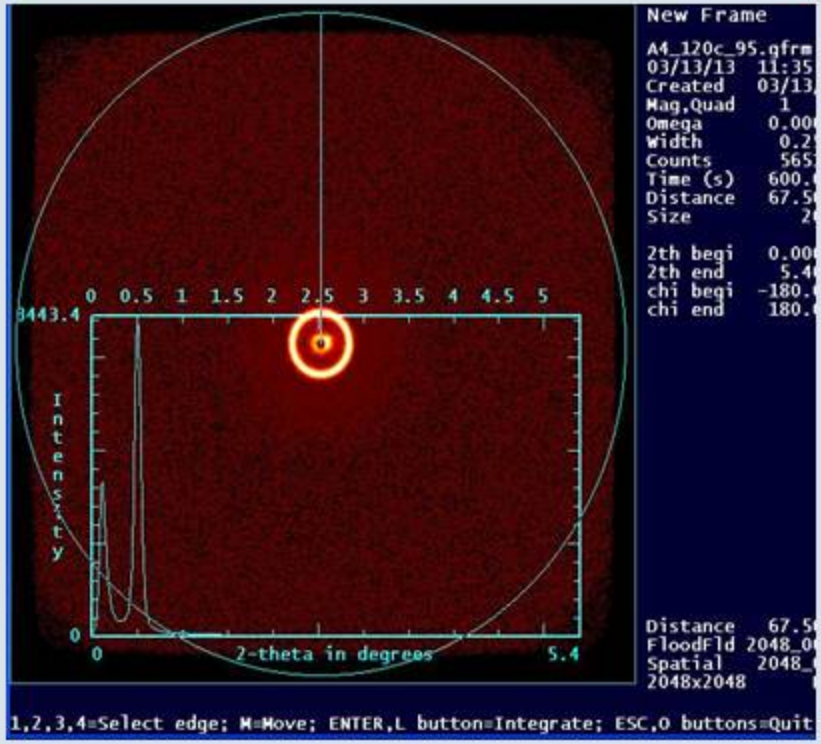
1. 轉換Pixel to 2 Theta
Process>Spatial>Unwarp

2. 在First input frame filename 選擇要轉換的檔案
3. 在First output frame filename選擇存放的位置及檔案名稱
4. 按"OK"

十一、SAXS Experiment-integration

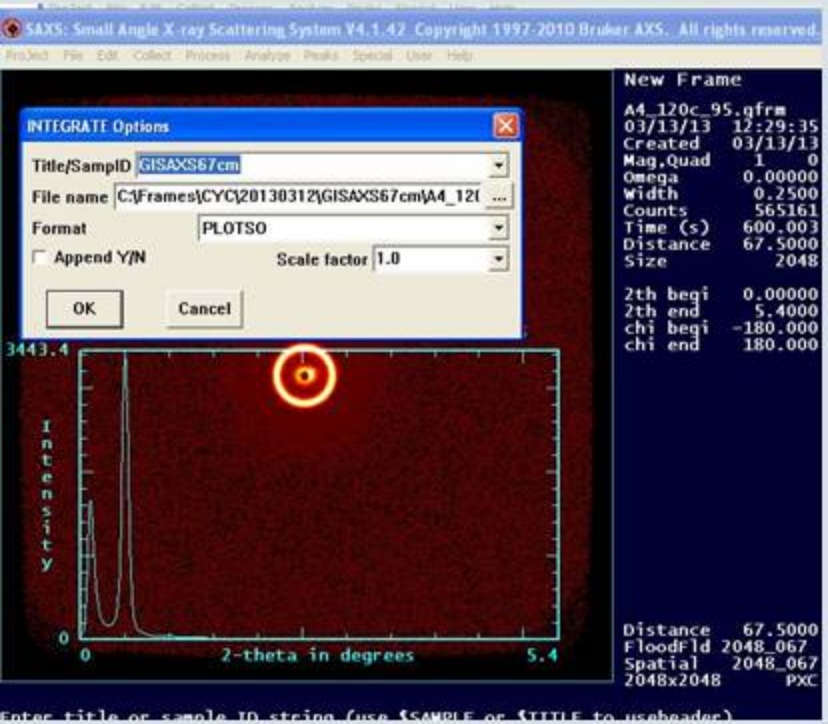
1.Peaks>Integrate>Chi
2. 按鍵盤1.2.3.4可選擇要改變的範圍，
利用滑鼠滑動來選擇範圍，ESC可重置，
按Enter則是決定積分

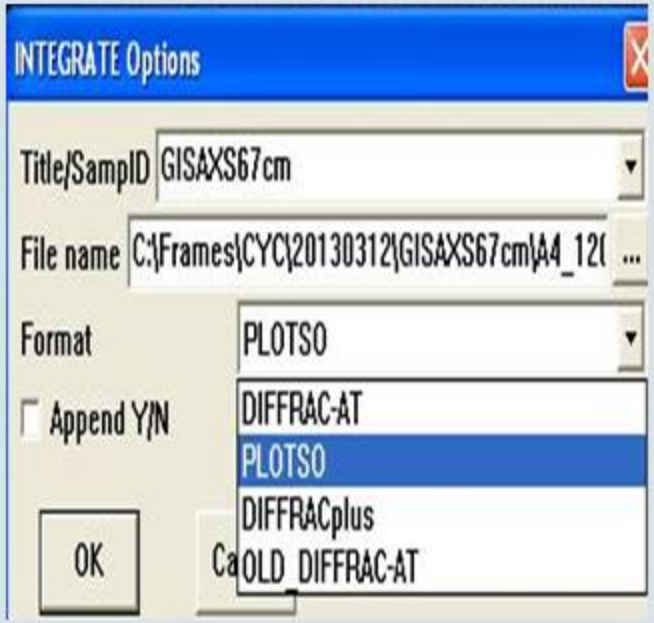




十一、SAXS Experiment-integration

積分之後





Sample名稱

存檔路徑及名稱

存檔格式

DIFFRACplus-Bruker Software PLOTSO - TXT

十一、SAXS Experiment-Transmission

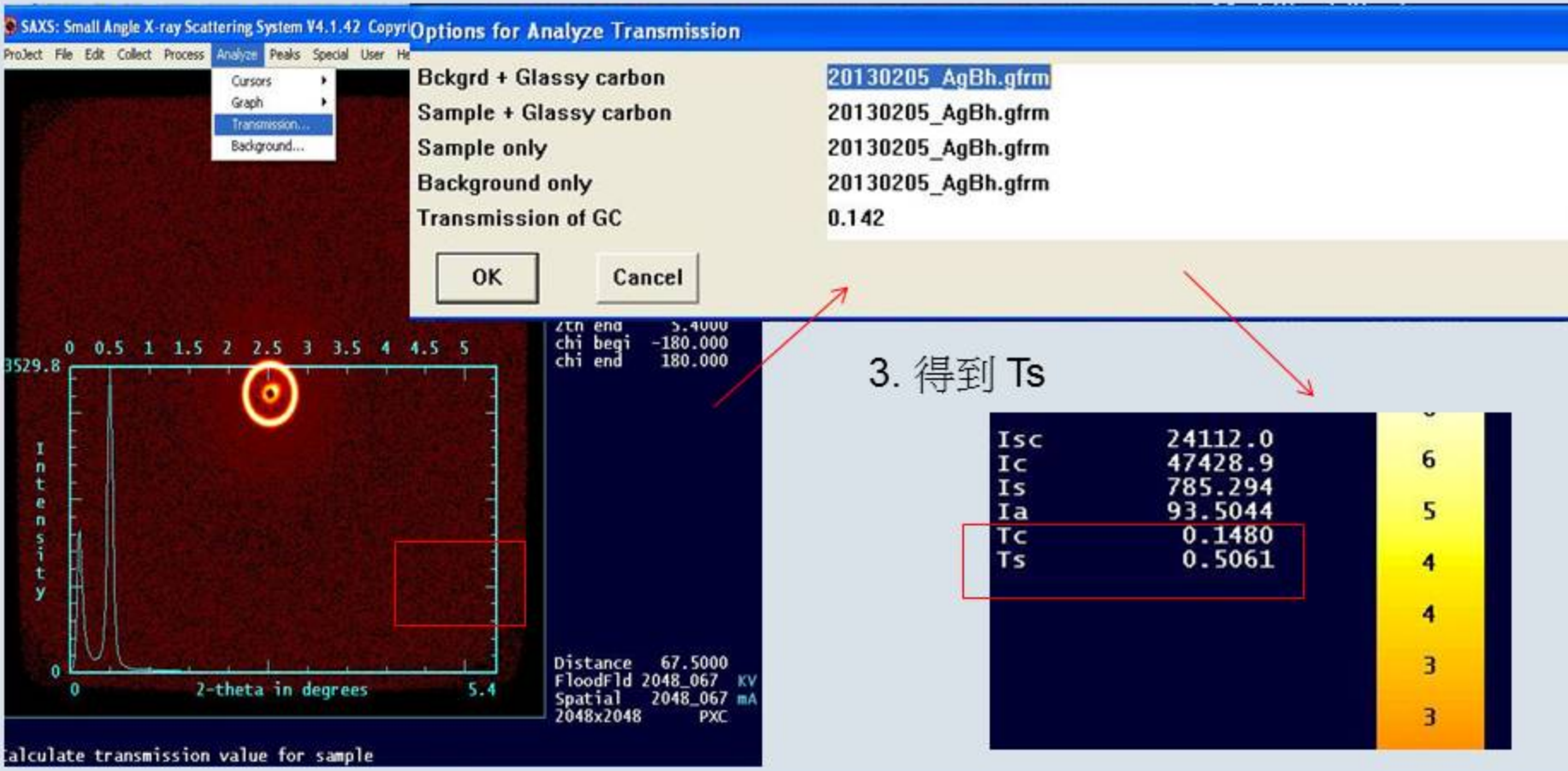
計算Transmission要做四個實驗

1. Background + GC
2. Sample + GC
3. Sample
4. Background
5. TS of GC為固定常數

十一、SAXS Experiment-Transmission

1. Analyze > Transmission

2. 選擇已經準備好的檔案



3. 得到 Ts

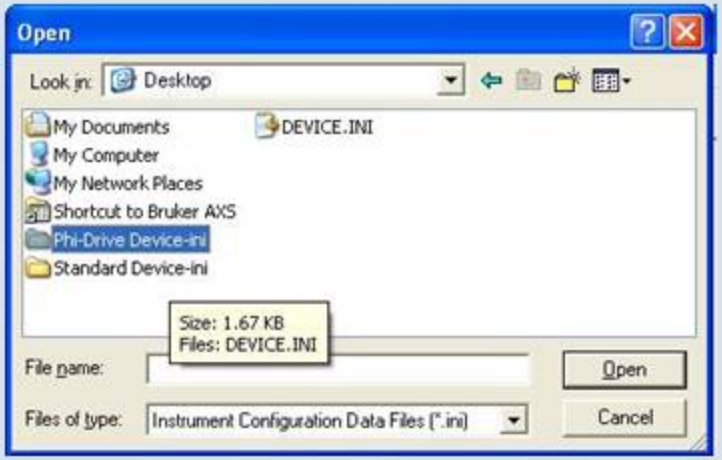
十二、GISAXS Experiment

1. 在切換至GISAXS的配置前，必須先將X光的主機關閉，請執行關機步驟到步驟8
2. 在更換不同偵測器距離(管長)前，必須先將X光的高壓關閉，請執行關機步驟到步驟6
3. 在執行量測前，一定要確定擺放樣品艙體的真空及X光路徑管路的真空開關已經開啟

十二、GISAXS Experiment

1. 在桌面上點選 FileTransfer.exe

2. 選擇開啟

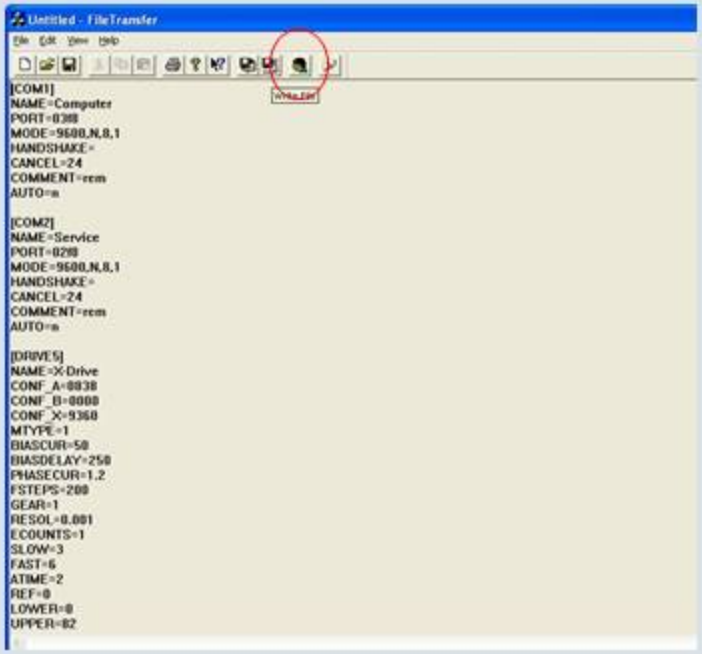


3. 桌面上有兩個關於系統參數切換的資料匣，內容物如名稱所示。

※Phi Drive：GISAXS使用

Standard：SAXS 及溫控SAXS使用

十二、GISAXS Experiment



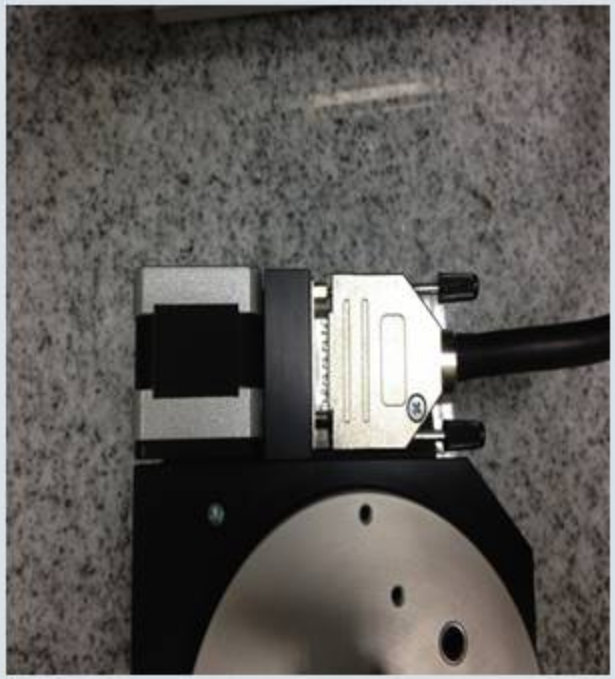
1. 系統參數打開後
2. 選擇 “Write File”

3. 選擇要更換的 “Device.ini”

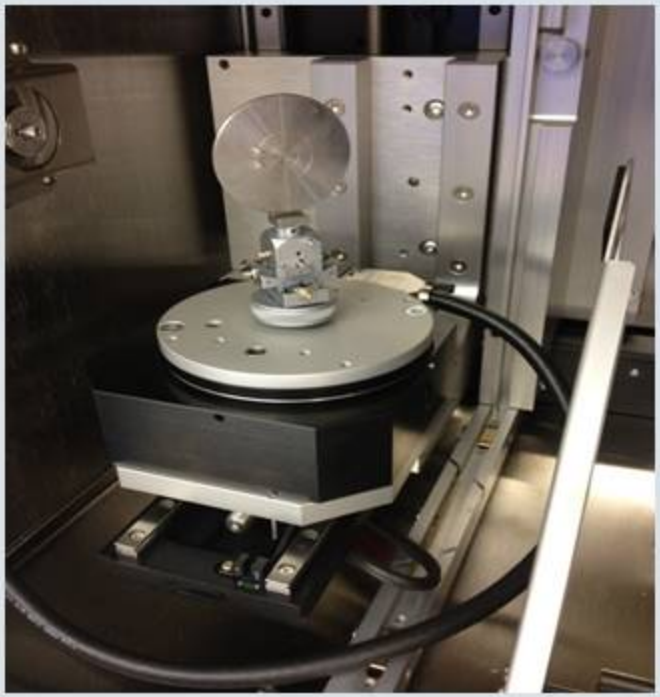
十二、GISAXS Experiment

1. 依照關機步驟直到按“紅色O”的按鈕關掉系統儀器為止

2. 接GISAXS的載台及電源線組合

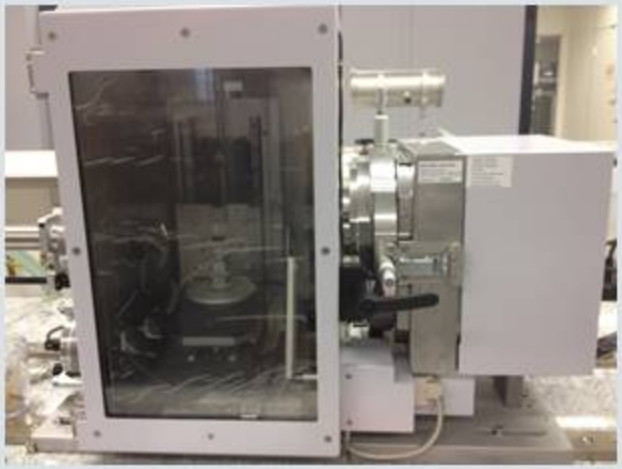


3. 安裝GI-SAXS的樣品載台



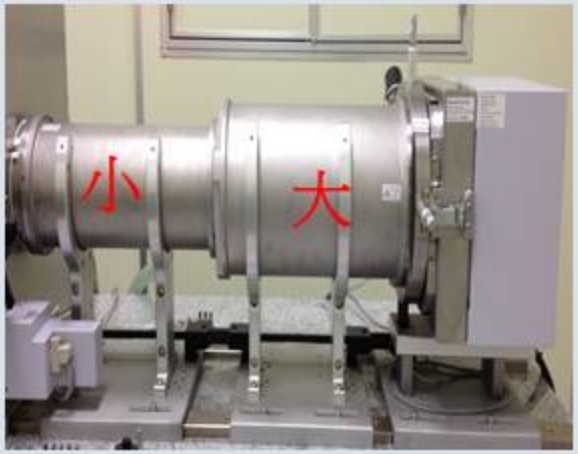
十二、GISAXS Experiment

4. 移動Detector的位置，
並將其固定



28cm

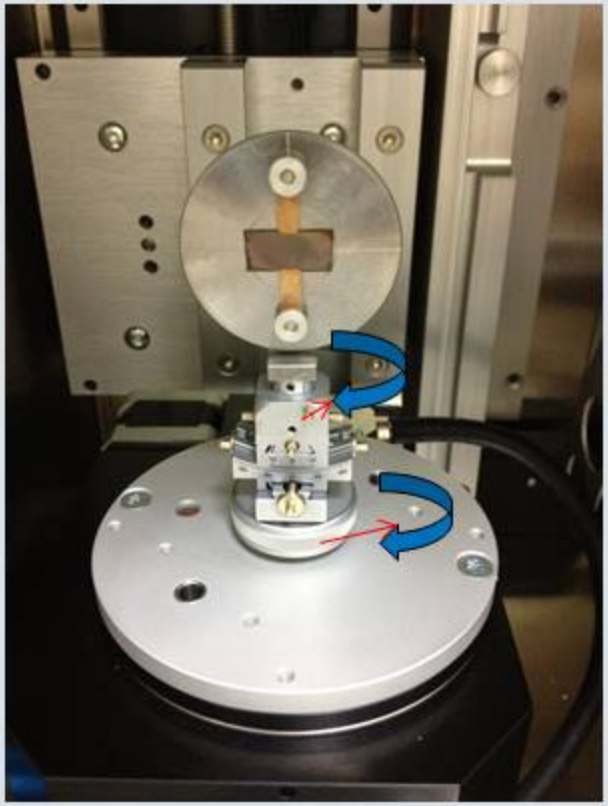
68cm



107cm

5.更換完管徑並確認Beam Stop也更換完畢後，請依照開機步驟7~28，執行開機動作直到電壓電流維持在50，50

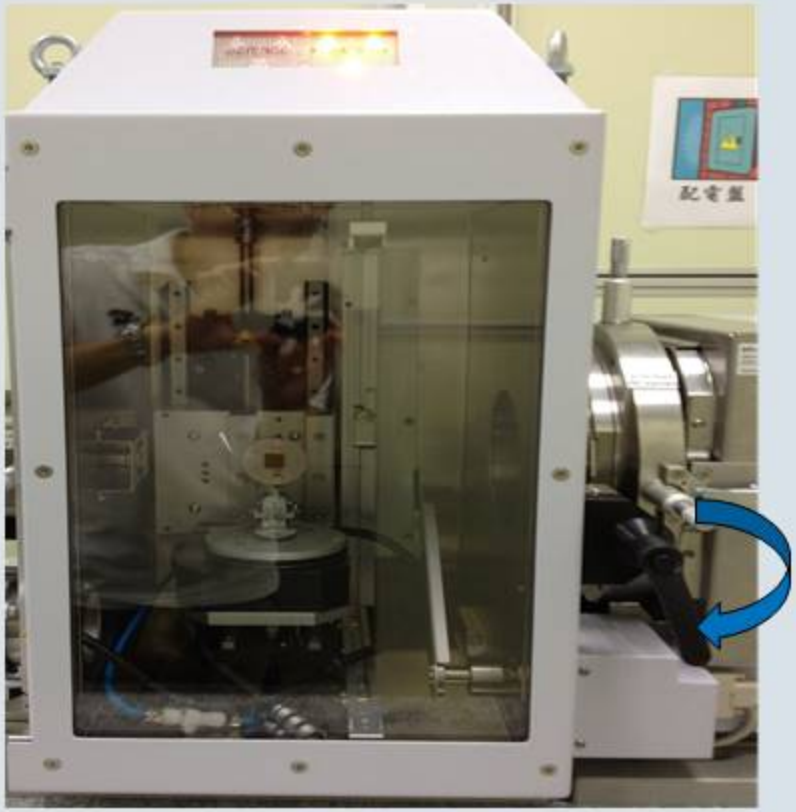
十二、GISAXS Experiment



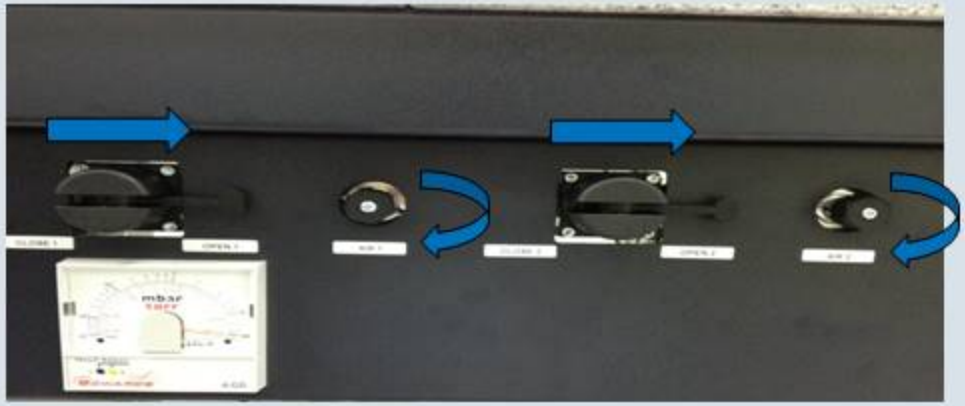
1. 利用夾具將樣品固定在支架上，樣品置中擺放，夾具以能固定樣品並且越少碰觸越好

2. 將支架固定在載台上，順時針將樣品固定，然後順時針將其鎖緊

十二、GISAXS Experiment



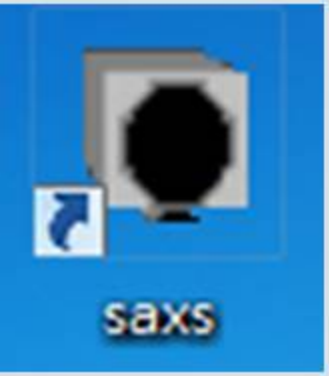
1. 將門往內推，然後順時針推把手將門鎖緊，鎖好後會聽到“咖”的聲音就完成



2. 將AIR1及AIR2順時針鎖緊，然後將CLOSE1和CLOSE2同時向右推到OPEN1和OPEN2

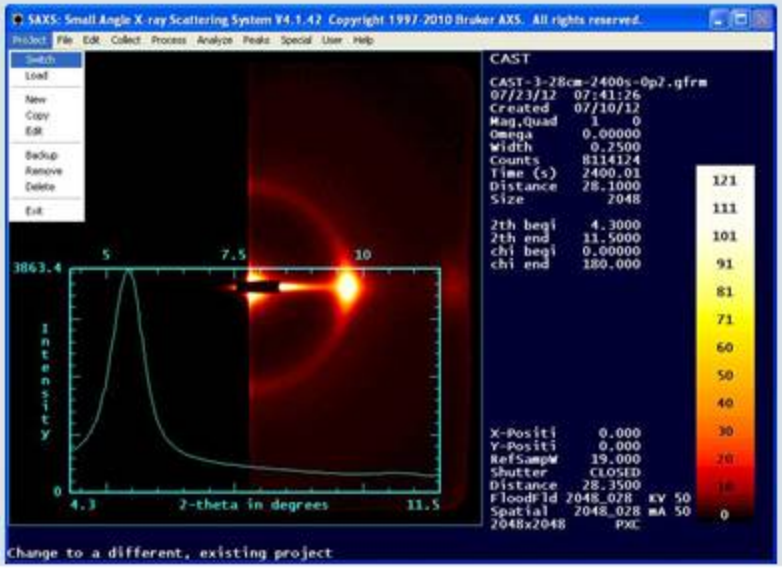
3. 比左圖還好的真空就能開始量測

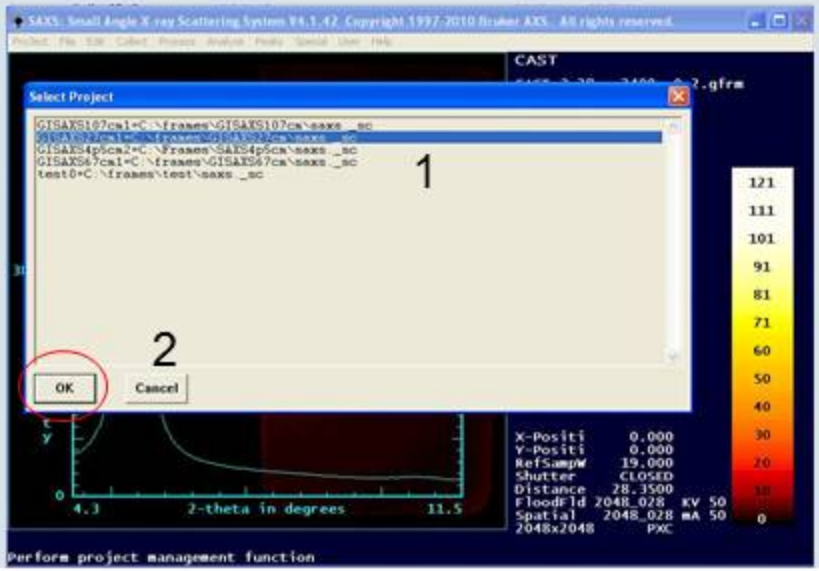
十二、GISAXS Experiment



在操作電腦的桌面上
打開 SAXS軟體

切換到要做實驗的距離，目前有兩個距離可供GISAXS使用
※107cm,68cm

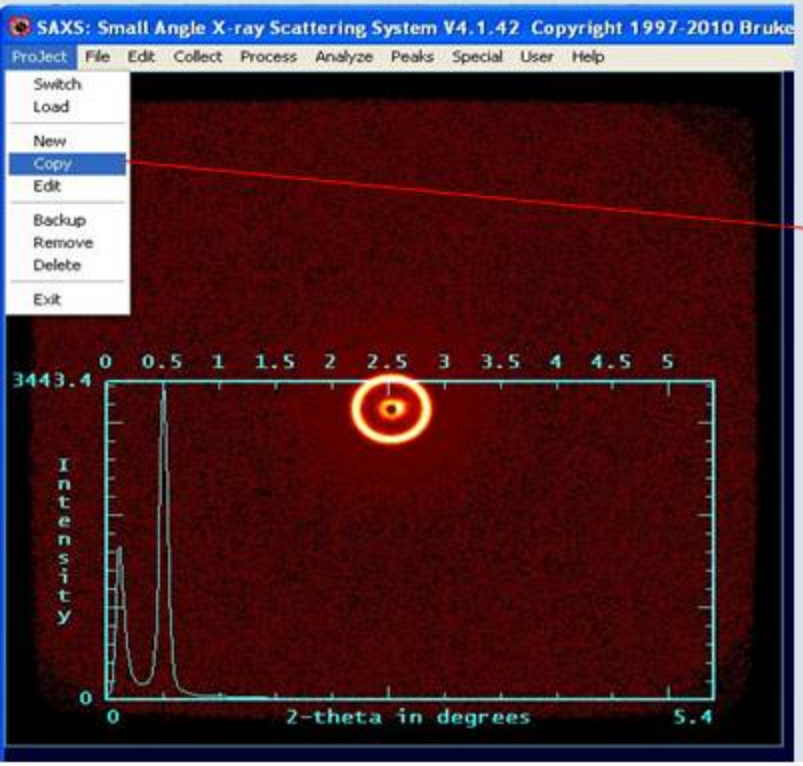




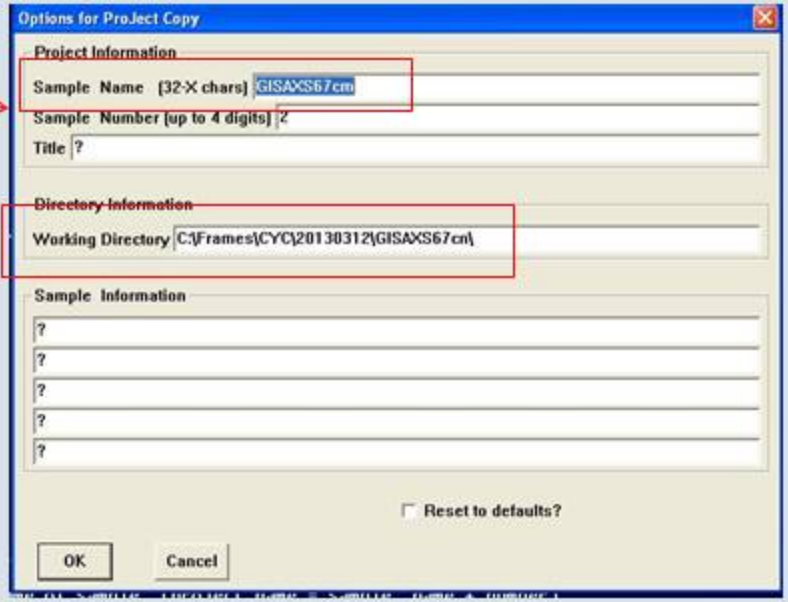
十二、GISAXS Experiment

3. Copy目前的狀態

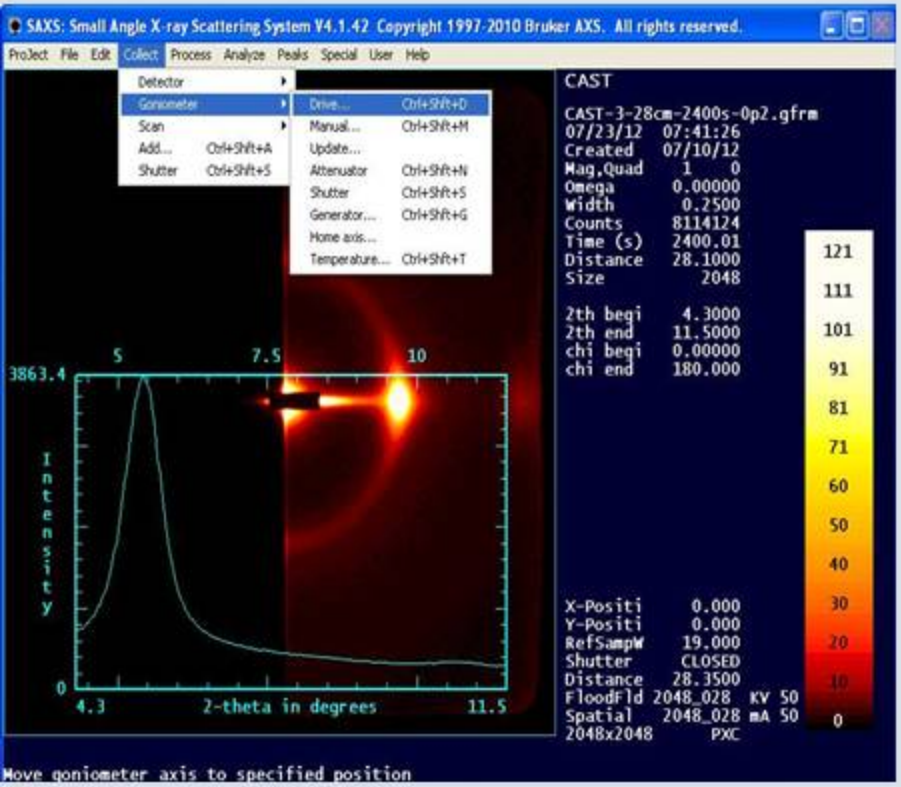
※此做法是為了不要覆蓋掉原始檔案的設定



4. 在sample name輸入名稱及working directory輸入指定存檔的位置



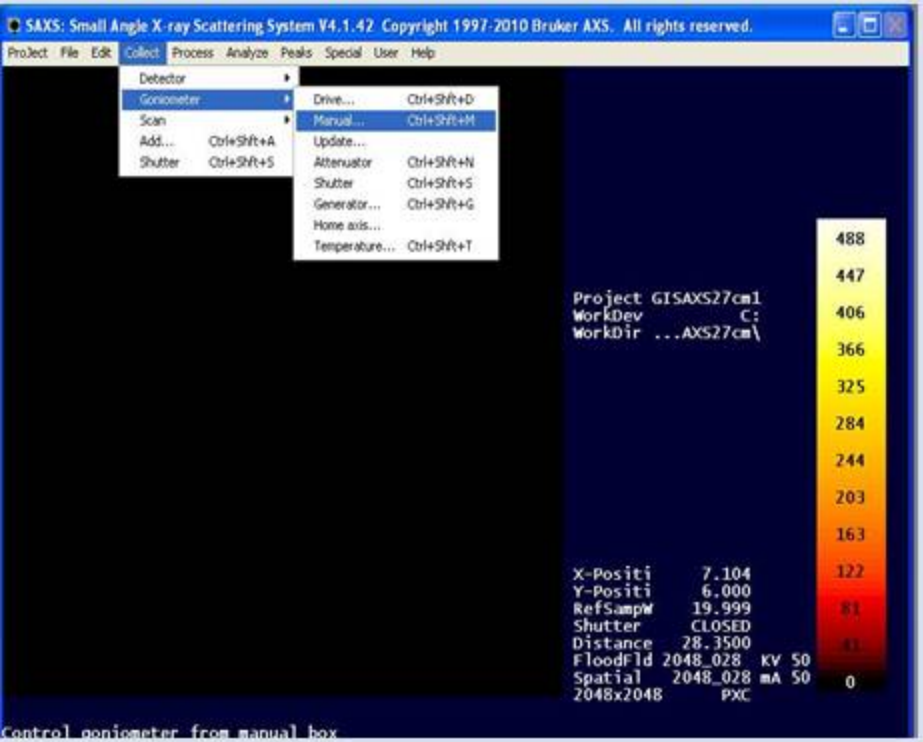
十二、GISAXS Experiment



Collect~>Goniometer~>
Drive

將所有的Axis設定跟上圖一樣

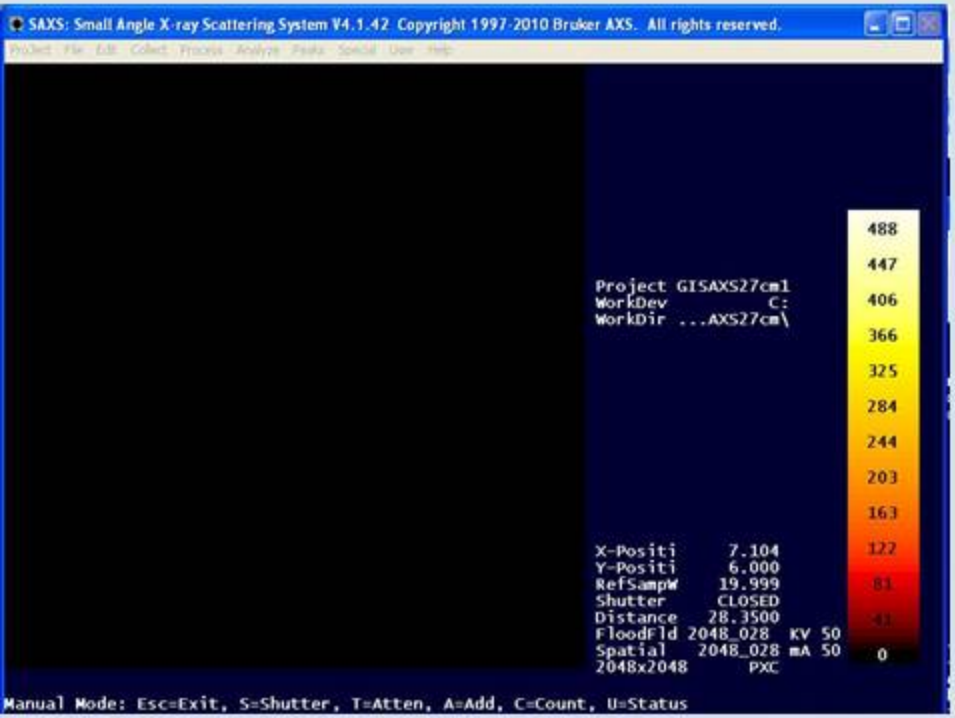
十二、GISAXS Experiment



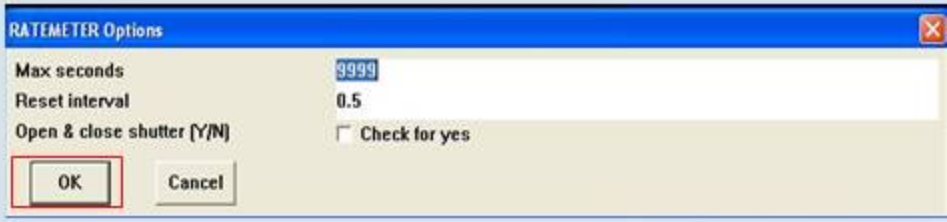
按"OK"

Collect~>Goniometer~>
Manual

十二、GISAXS Experiment



1. 按“S”開啟Shutter
2. 按”C”開啟Ratemeter

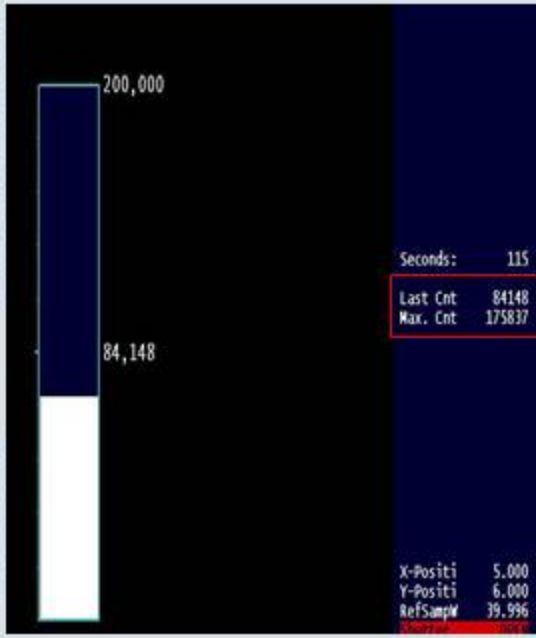


按”OK”

紀錄最高強度

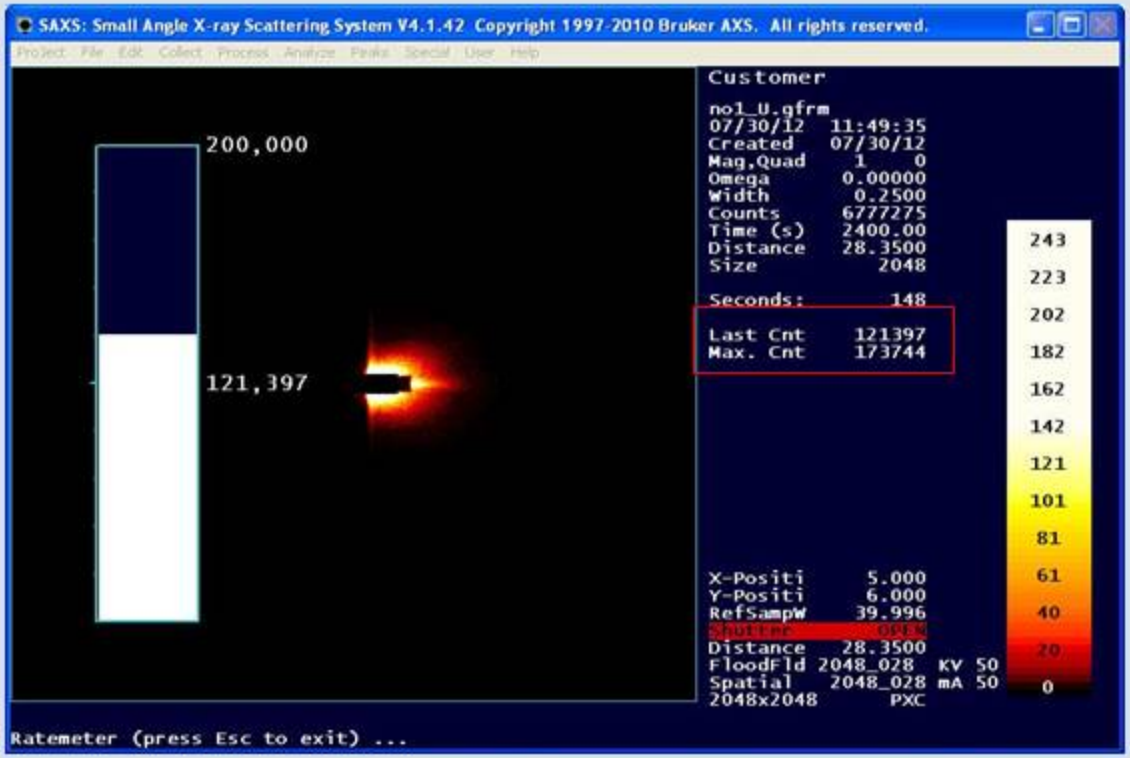
十二、GISAXS Experiment

按Shift+F1，激活外部控制器



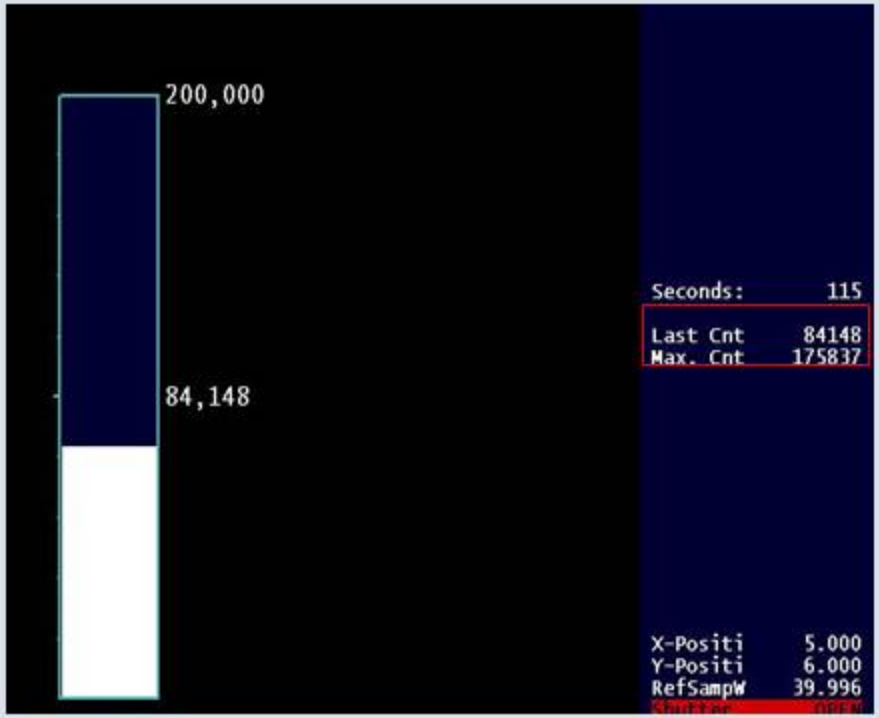
1. 按”5”切換到X-Drive
2. 按”－”降低轉速
3. 按 “↑”或”↓”來移動X軸，直到強度少一半

十二、GISAXS Experiment



4. 按“3”切換到Phi
5. 按”－”降低轉速
6. 按 “↑”或”↓”來移動Phi，
   直到最大強度

十二、GISAXS Experiment



7. 按”5”切換到X-Drive
8. 按”－”降低轉速
9. 按 “↑”或”↓”來移動X軸，
   直到強度少一半

十二、GISAXS Experiment

GISAXS-scan.sim - Notepad

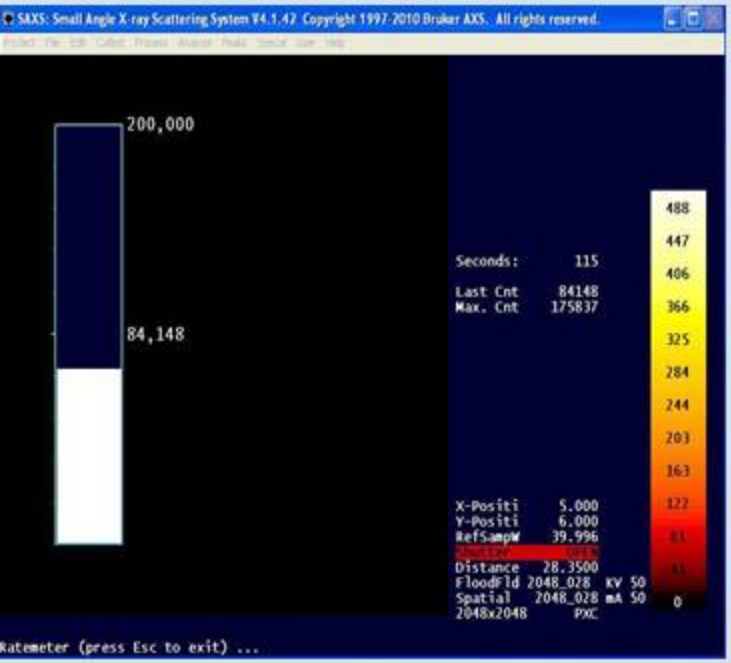
File Edit Format View Help

```
!  Phi scan for GISAXS experiments
!  K. Erlacher and A. Hsu
!  June 2012
!-----------------------------------

#ON ERROR THEN STOP:

#Let %P=344.932| !Starting position of phi
#LET %X=7.106
#LET %Y=6.000
#Let %I=000
#LET %N=010      !Number of phi positions
#LET %S=-0.1     !Step size in phi
#LET %F="align-27cm"     !Base File name


#while ('%I'<='%N') Do


GONIOMETER /DRIVE '%X' '%Y' 20 0.000 '%P'


ADD 10 /CLEAR /COUNTS=10000000 /DISPLAY=15 /REALTIME /RESET=0 /SHUTTER &
 /SLAM=$null /BARTIME=0.0 /SLAM=$null


SPATIAL /UNWARP $frame 1 '%F'_'%I'.gfrm /NOBEAMCENTER /DISPLAY=-1

#LET %P=%P+%S
#INC %I
#WEND

Menu
```

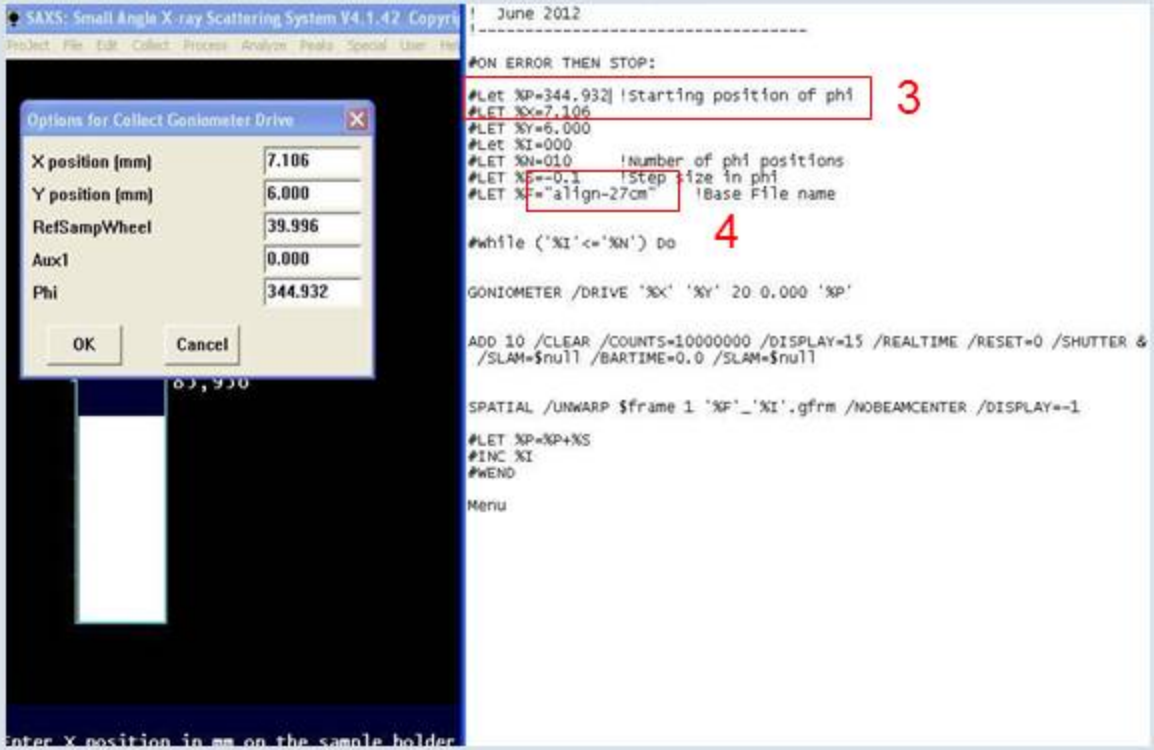
打開位於C:\ Frames\GISAXS27cm裡的"GISAXS-scan 的檔案。

※在不同的距離的Project資料匣裡有各自的GISAXS-scan檔案

十二、GISAXS Experiment

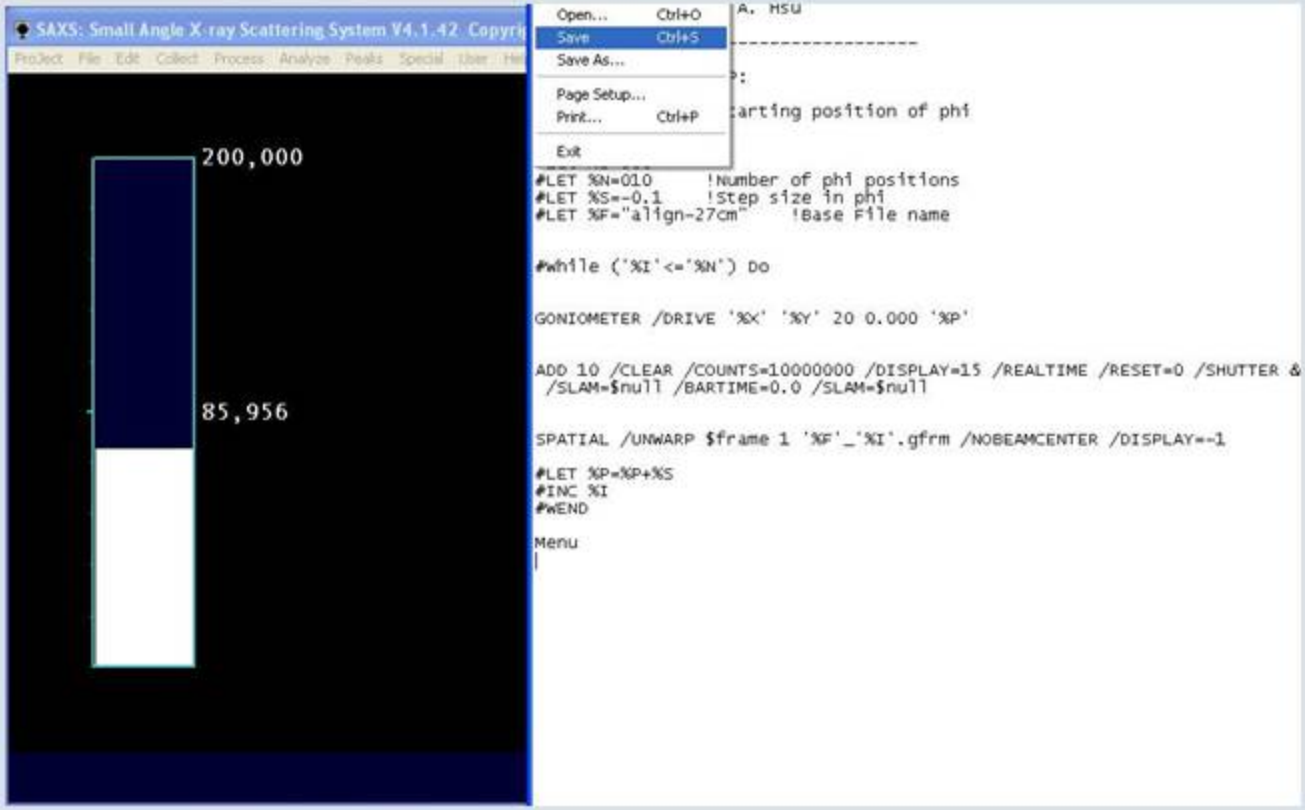


按 “Esc”鍵盤鈕，離開Manual



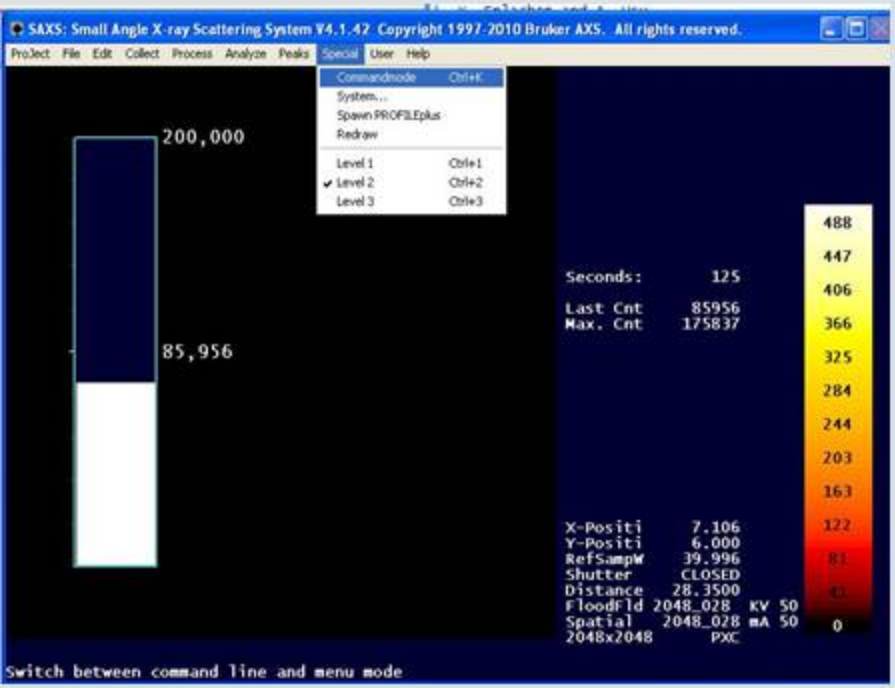
1. 按Collect>Goniometer>Drive
2. 紀錄X及Phi的位置
3. 改變GISAXS-Scan內的“%P”及 “%X”
4. 更改存放檔案的檔名

十二、GISAXS Experiment

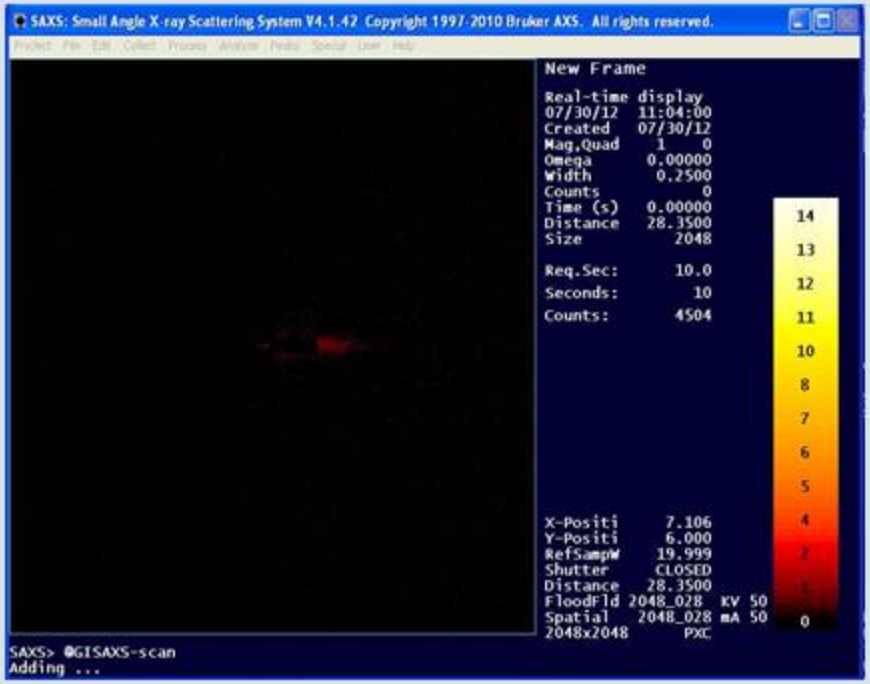


1. File>Save，將更改後的檔案存檔
2. 回到SAXS的軟體按ESC離開Drive的視窗

十二、GISAXS Experiment

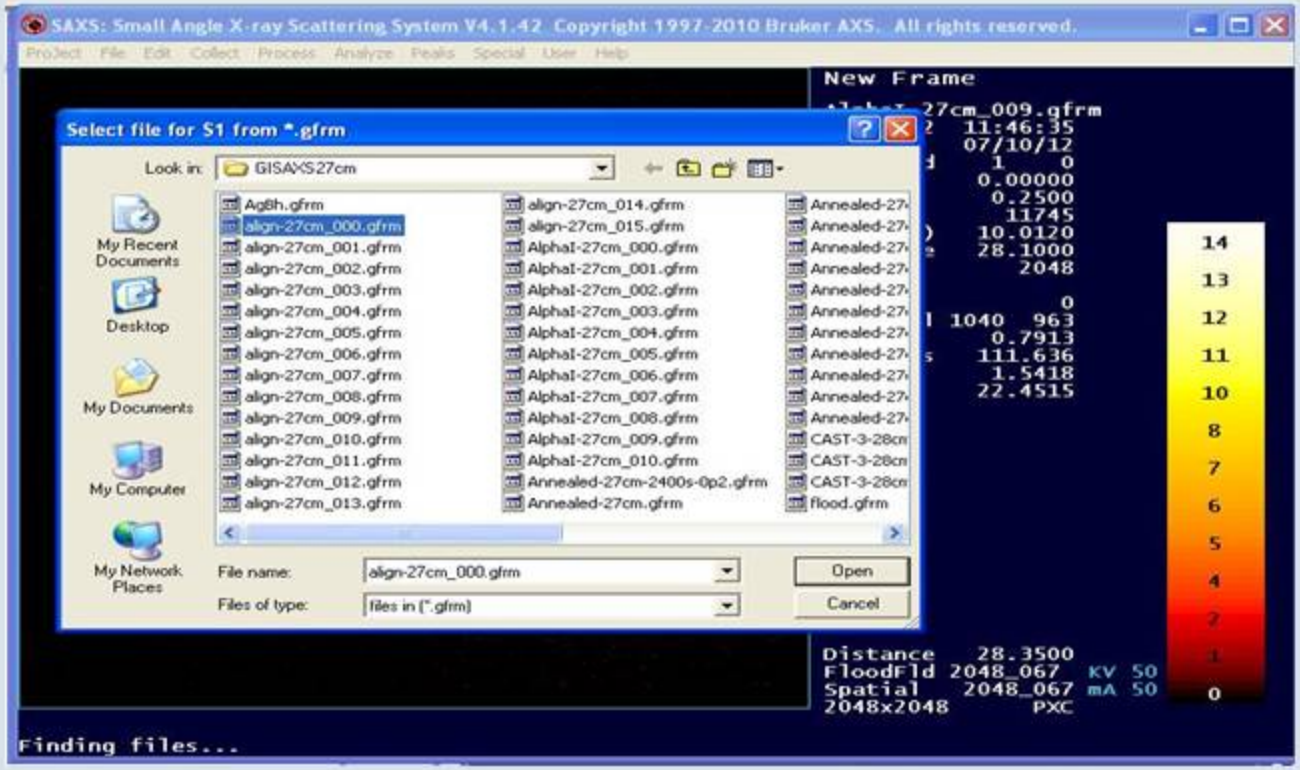


1. Special>Commandmode



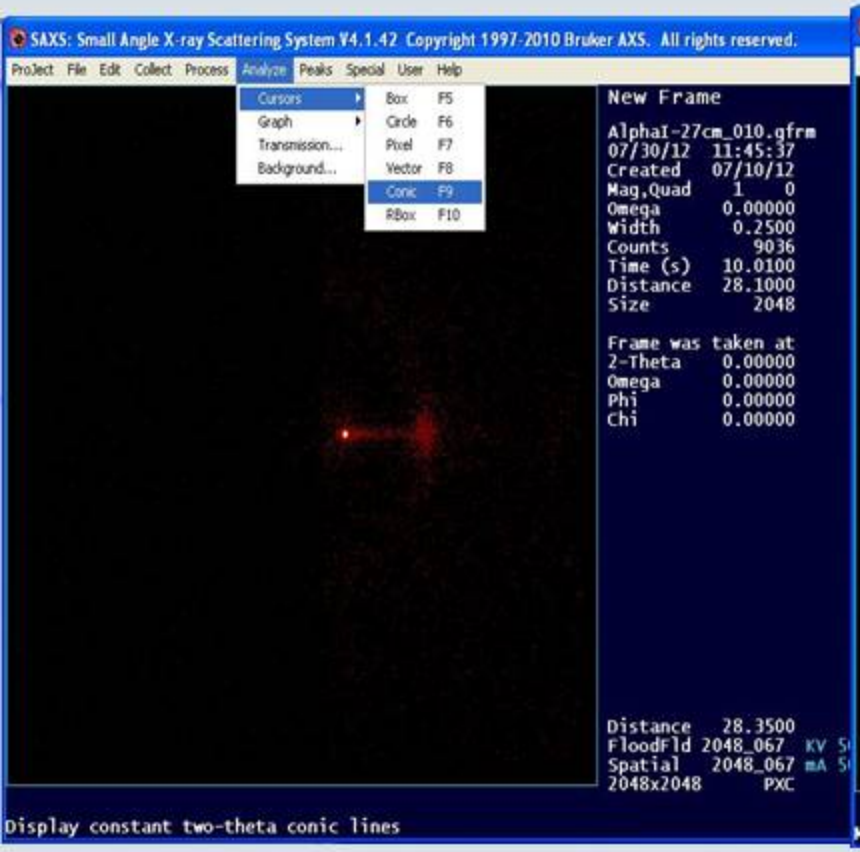
2. 輸入@GISAXS-scan
3. Enter

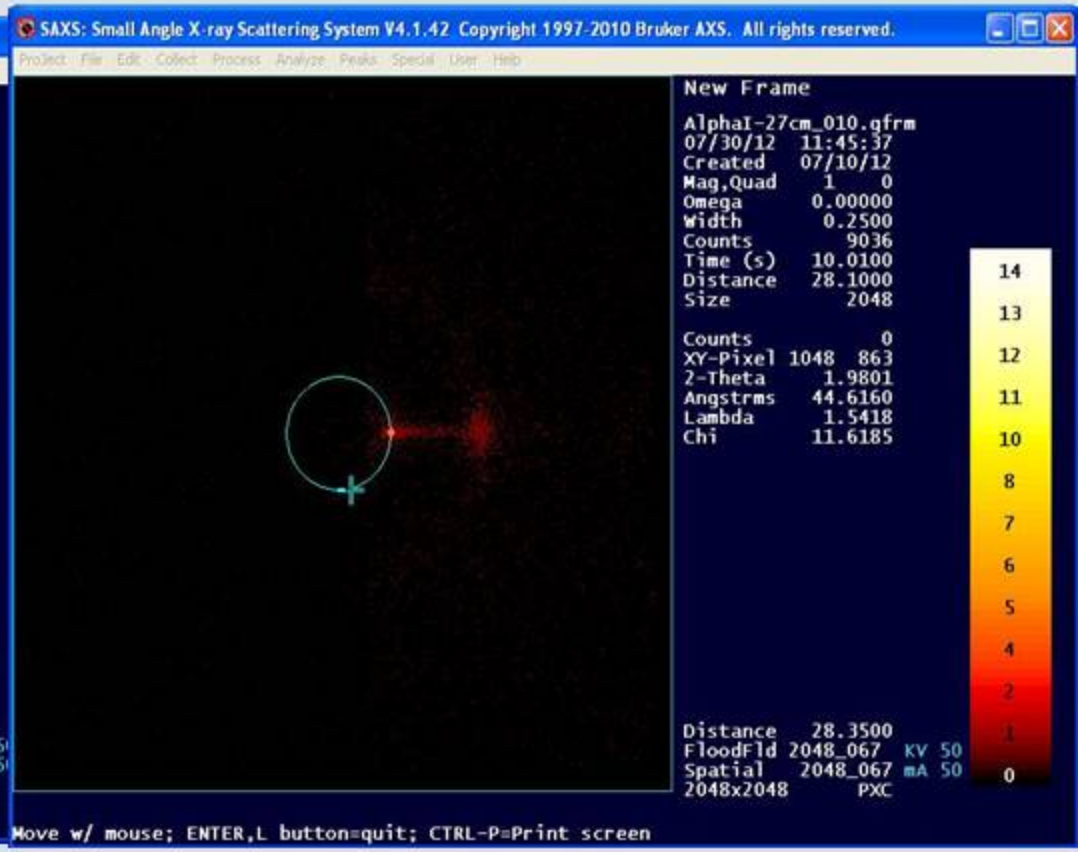
十二、GISAXS Experiment



1. File > Display > Open
2. 開啟剛剛執行GISAXS-scan內所設定的檔名

十二、GISAXS Experiment

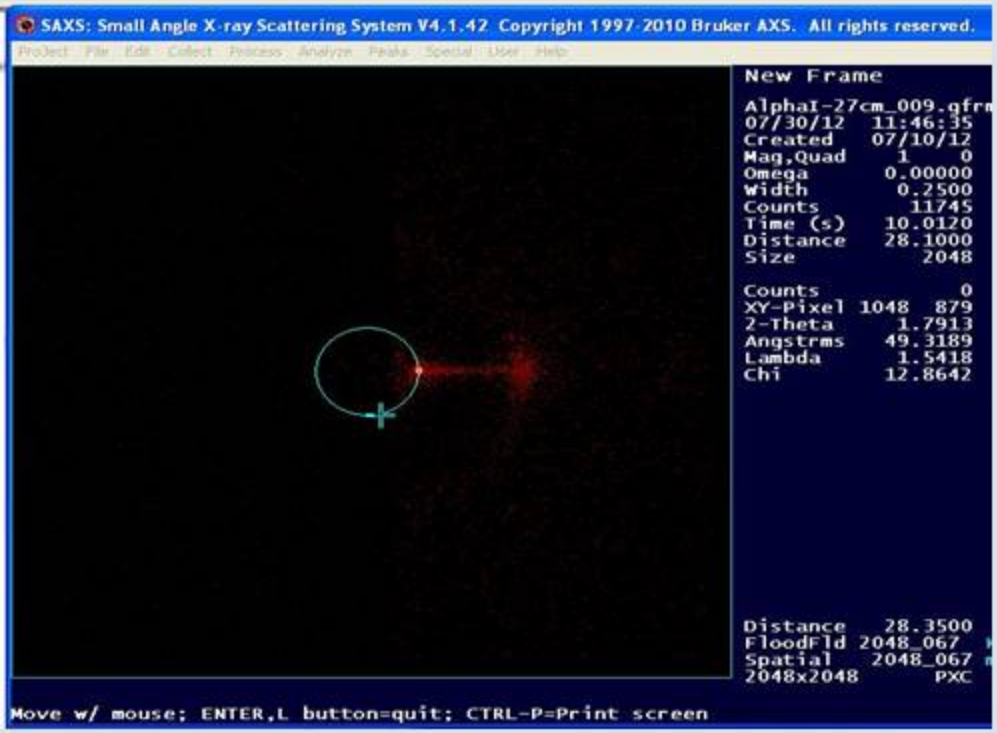




Analyze>Cursors>Conic

利用鍵盤上或下鍵調整讓圓線在亮點上

十二、GISAXS Experiment



1. 紀錄2-Theta的數值
2. 利用鍵盤的Ctrl+左右鍵，能切換不同入射角所看的的圖片
3. 圖片的名稱代表此張圖片的入射角是多少，例如009=alphal “0.9”，010=alphal”1.0”

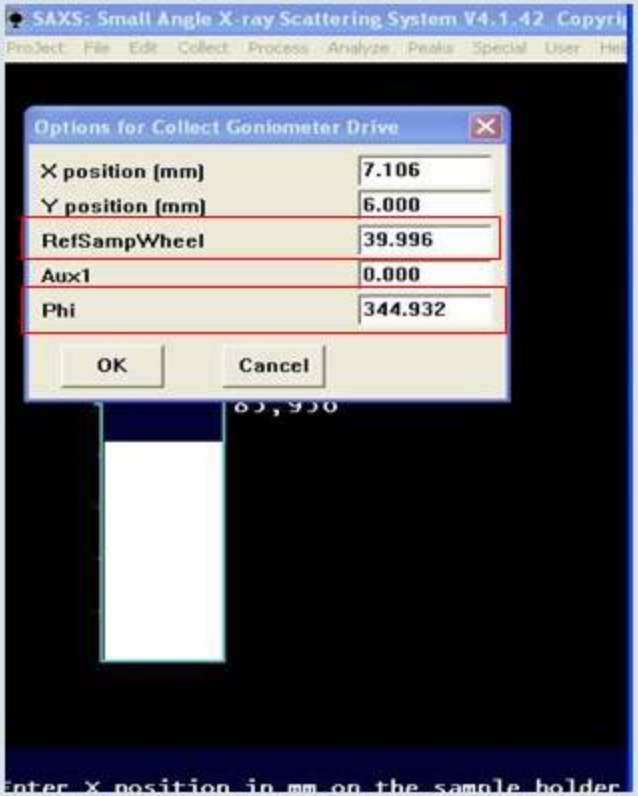
計算方式:
例如
009時得到2Theta為 2.1
2.1/2-0.9=0.15 (offset)

010時得到2Theta為 2.3
2.3/2-1=0.15(offset)

這代表 Alpha I (0) = Phi (rel.)+0.15 (offset)

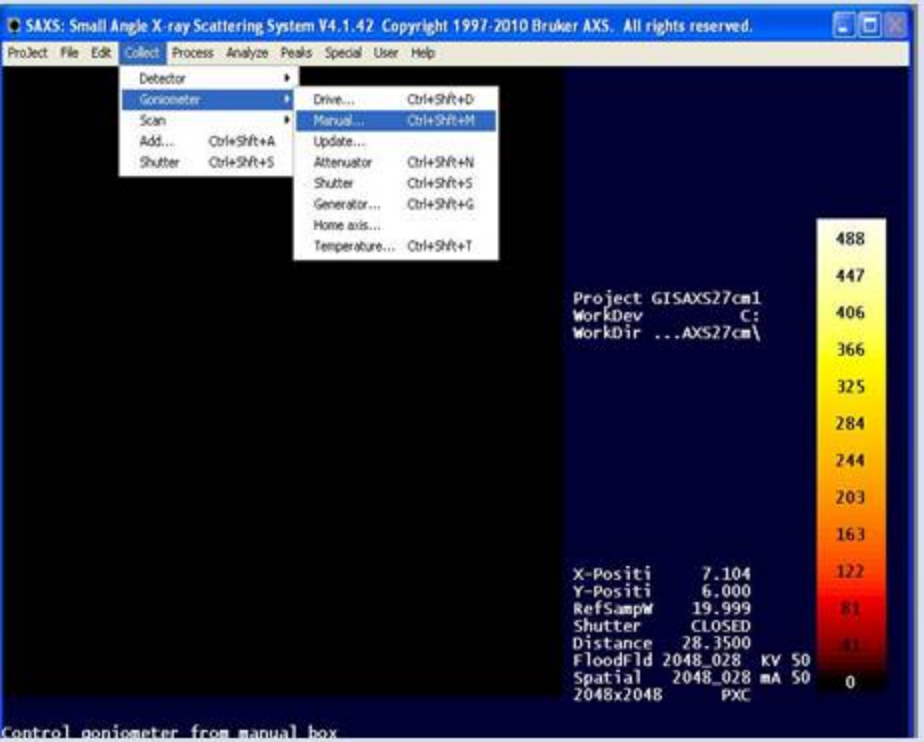
Ex. 344.6+0.15= 344.75 = Alpha I (0)

十二、GISAXS Experiment



1. 在Phi 輸入剛剛計算所得到的Alpha I(0)
2. 然後在RefSampWheel 輸入40

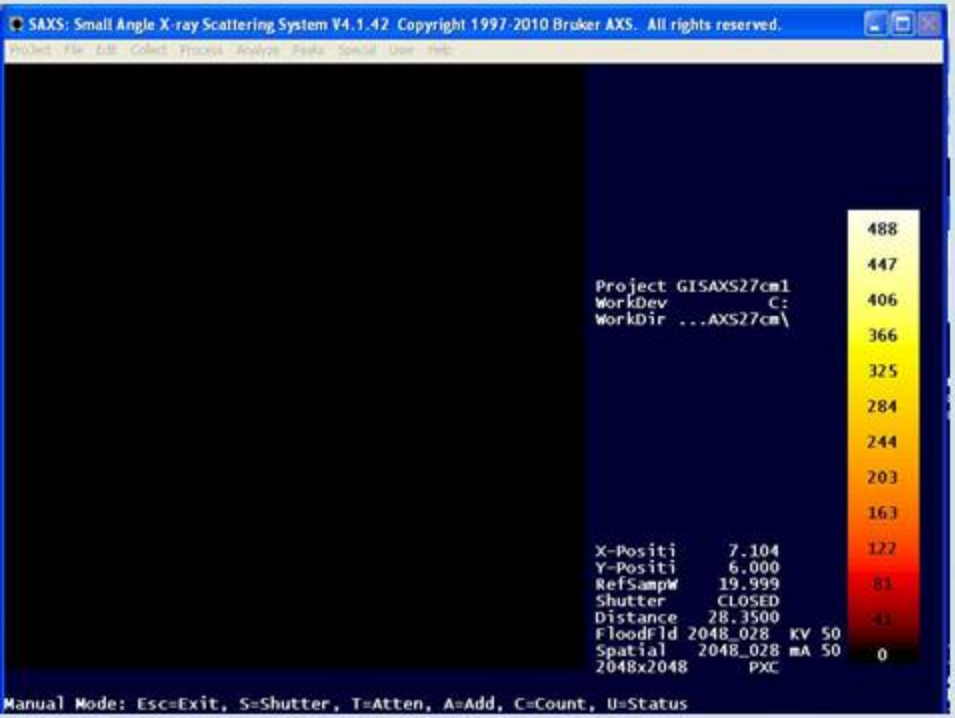
十二、GISAXS Experiment

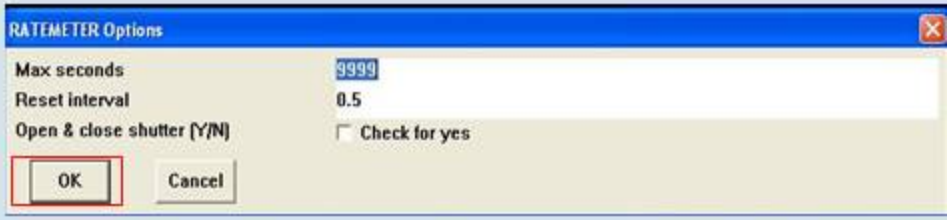


按"OK"

Collect~>Goniometer~> Manual

十二、GISAXS Experiment

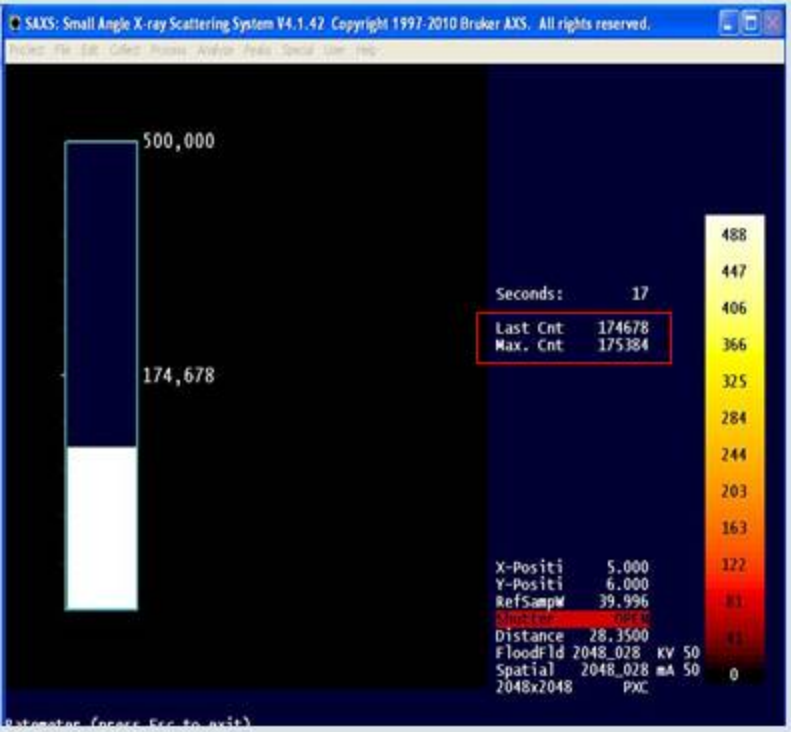




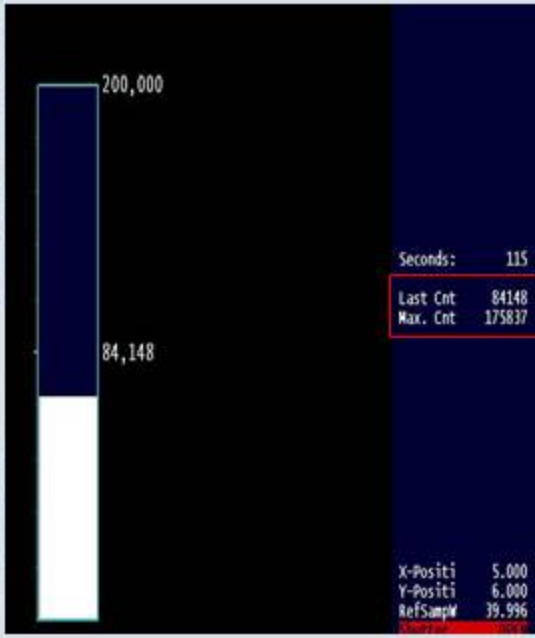
按"OK"

1. 按"S"開啟Shutter
2. 按"C"開啟Ratemeter

十二、GISAXS Experiment



紀錄最高強度



1. 按”5”切換到X-Drive
2. 按”－”降低轉速
3. 按 “↑”或”↓”來移動X軸，直到強度少一半

十二、GISAXS Experiment

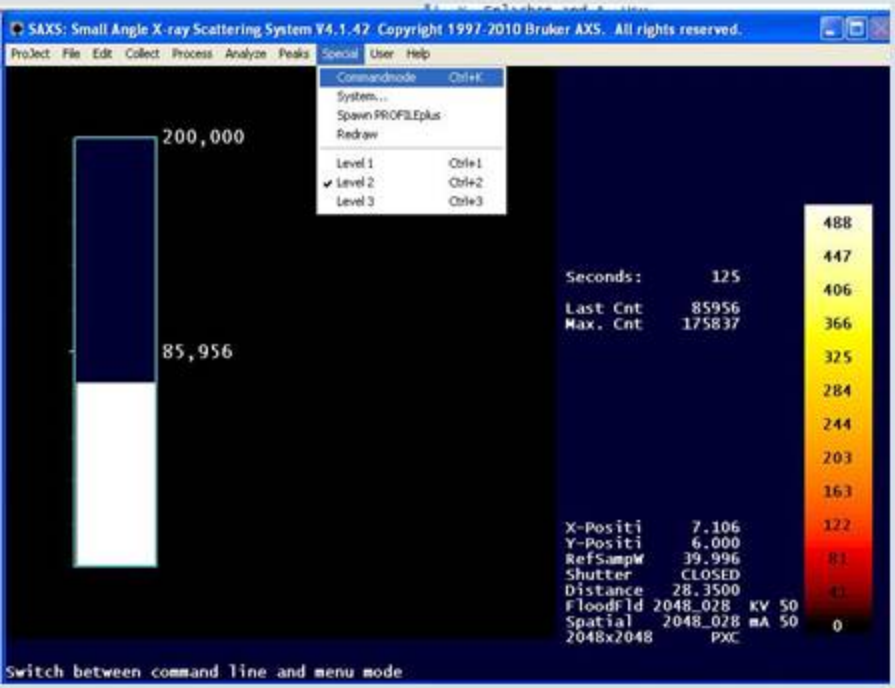
```
!  June 2012
!---------------------------------

#ON ERROR THEN STOP:

#Let %P=344.932 !Starting position of phi
#LET %X=7.106
#LET %Y=6.000
#Let %I=000
#LET %N=010      !Number of phi positions
#LET %S=-0.1     !Step size in phi
#LET %F="align-27cm"     !Base File name


#while ('%I'<='%N') Do


GONIOMETER /DRIVE '%X' '%Y' 20 0.000 '%P'


ADD 10 /CLEAR /COUNTS=10000000 /DISPLAY=15 /REALTIME /RESET=0 /SHUTTER &
 /SLAM=$null /BARTIME=0.0 /SLAM=$null


SPATIAL /UNWARP $frame 1 '%F'_'%I'.gfrm /NOBEAMCENTER /DISPLAY=-1

#LET %P=%P+%S
#INC %I
#WEND

Menu
```

1

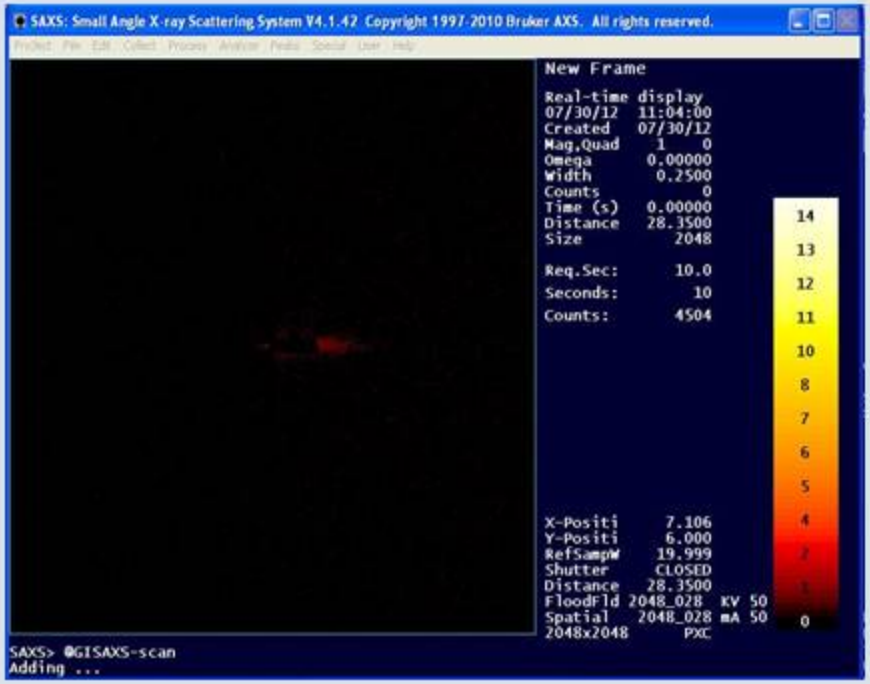
2

1. 將計算出的 Alpha I (0)輸入在”%P”
2. 將第二次所得到的X值輸入在“%X”
3. File>Save

十二、GISAXS Experiment

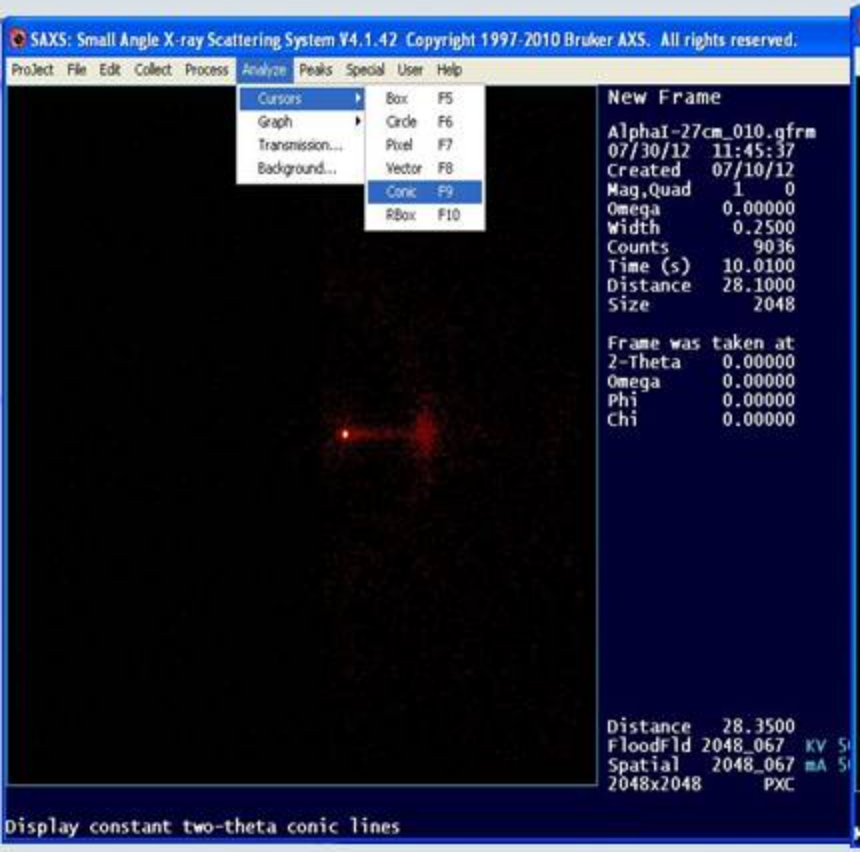


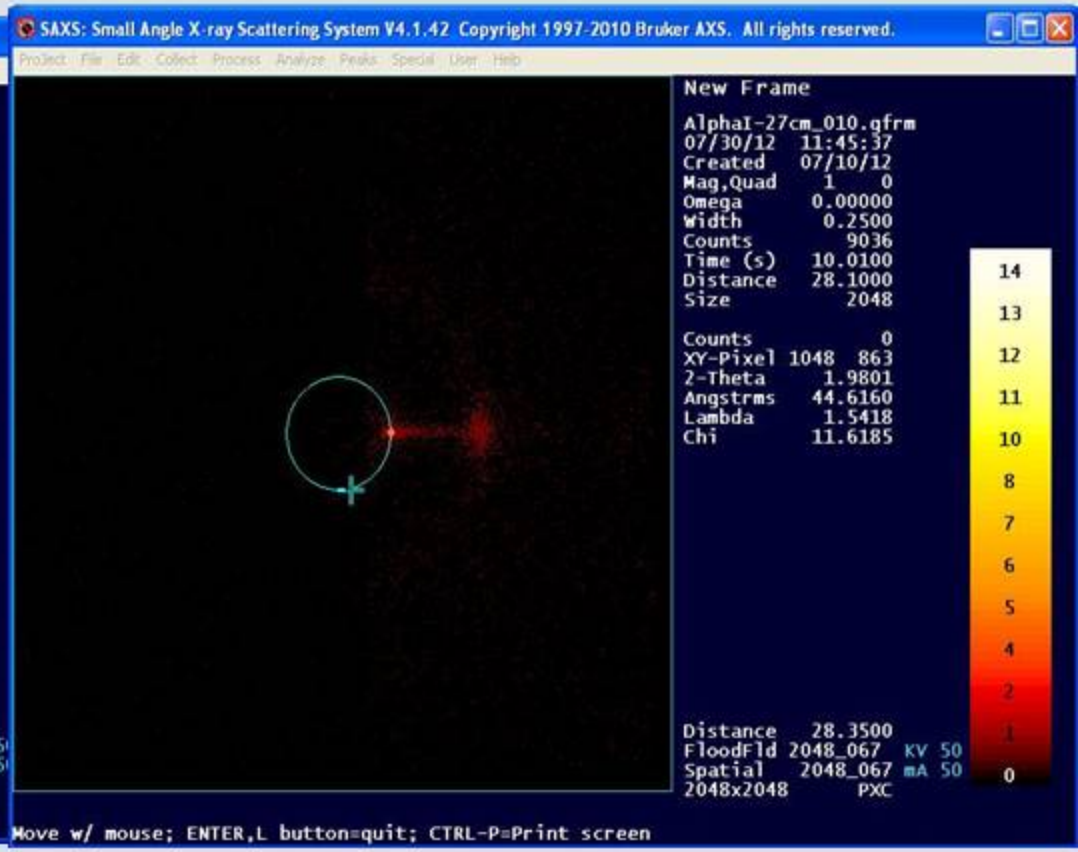
1. Special>Commandmode



2. 輸入@GISAXS-scan
3. Enter

十二、GISAXS Experiment

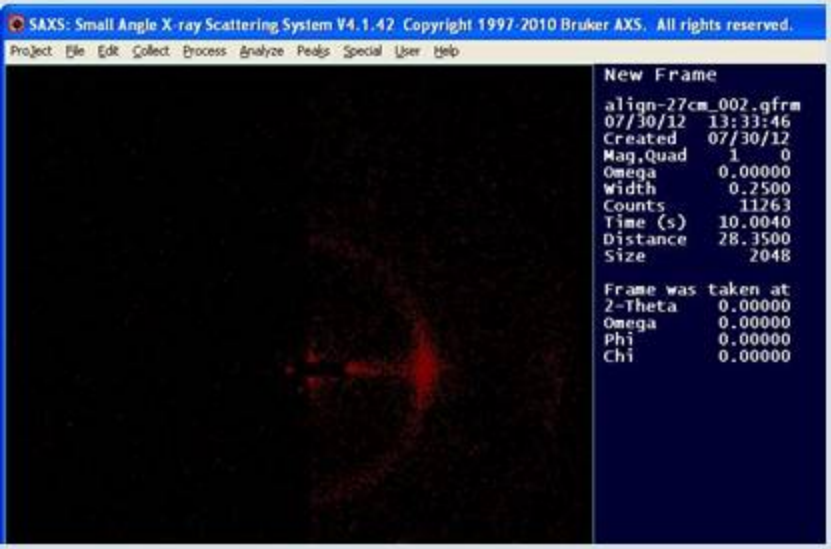




Analyze>Cursors>Conic

1. 利用鍵盘上或下鍵調整圓線在亮點上
2. 確認010時，2Theta約等於2。如果是的話表示Alpha I(0)以校正完畢

十二、GISAXS Experiment



1. 在之前定義正確的Alpha I(0)的量測檔按圖片裡也同時有最好Alpha I(exp.)的資訊，可藉由切換不同Alpha I的圖片，然後從Counts最好的強度判斷

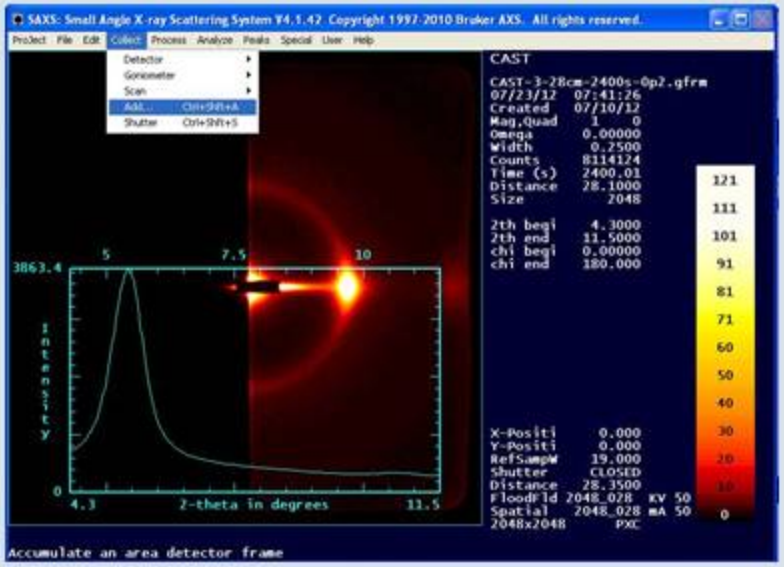
※最好的強度是不包括反射的訊號

2.從實際的圖片裡得知0.2是最好的入射角，因此AlphaI(0)-0.2 = Alpha I (exp.)

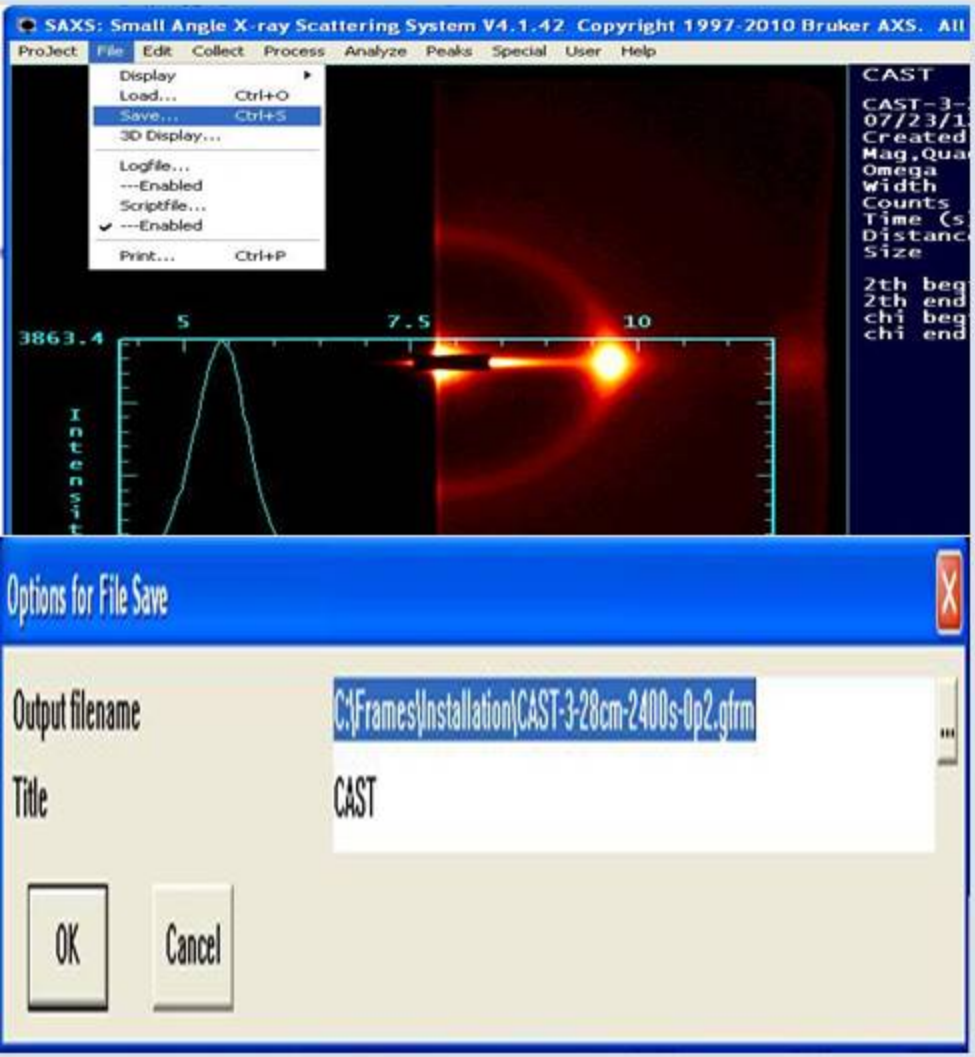
3. 將計算所得到的 Alpha I(exp.)輸入到Phi
4. 按OK

十二、GISAXS Experiment

量測指令: Collect~>Add
※快捷鍵: Ctrl+Shift+A



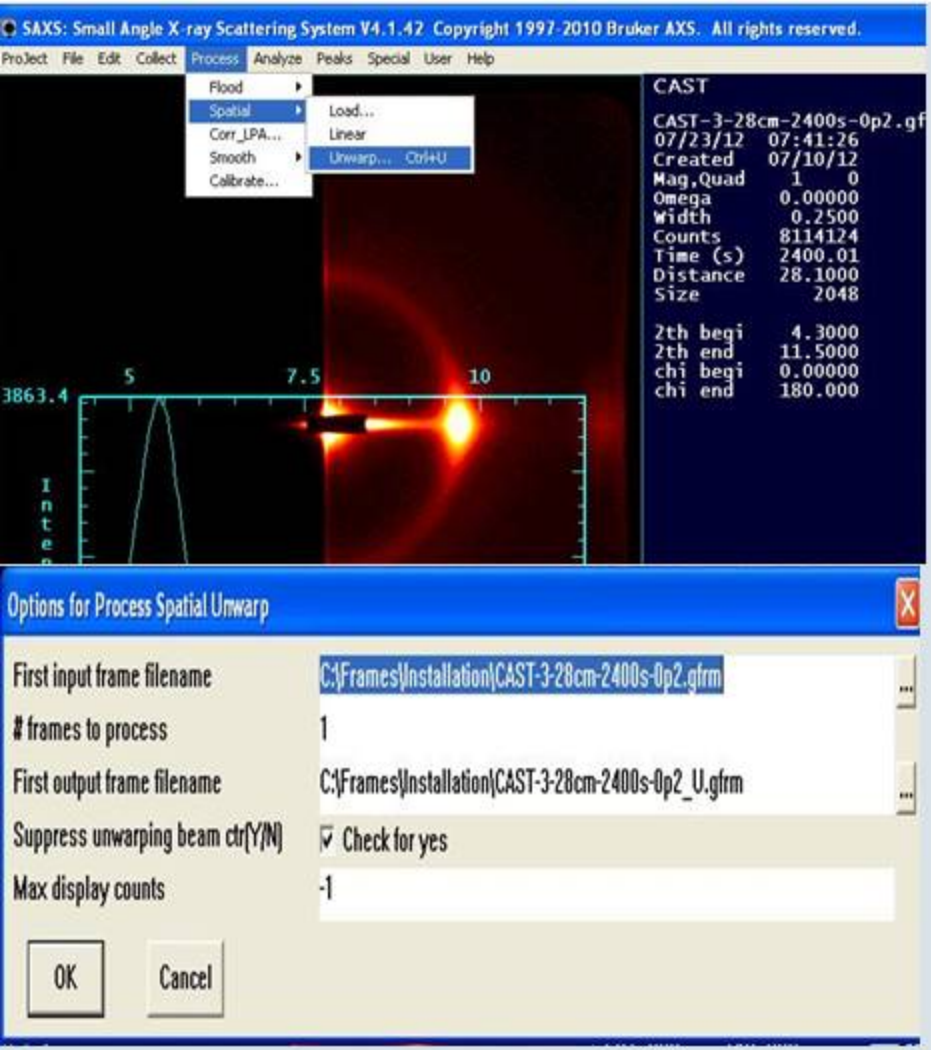
十二、GISAXS Experiment



1. 量測結束後要檔 :File>Save

2. 在Output filename裡選擇存放的路徑及名稱
3. 按“OK”

十二、GISAXS Experiment



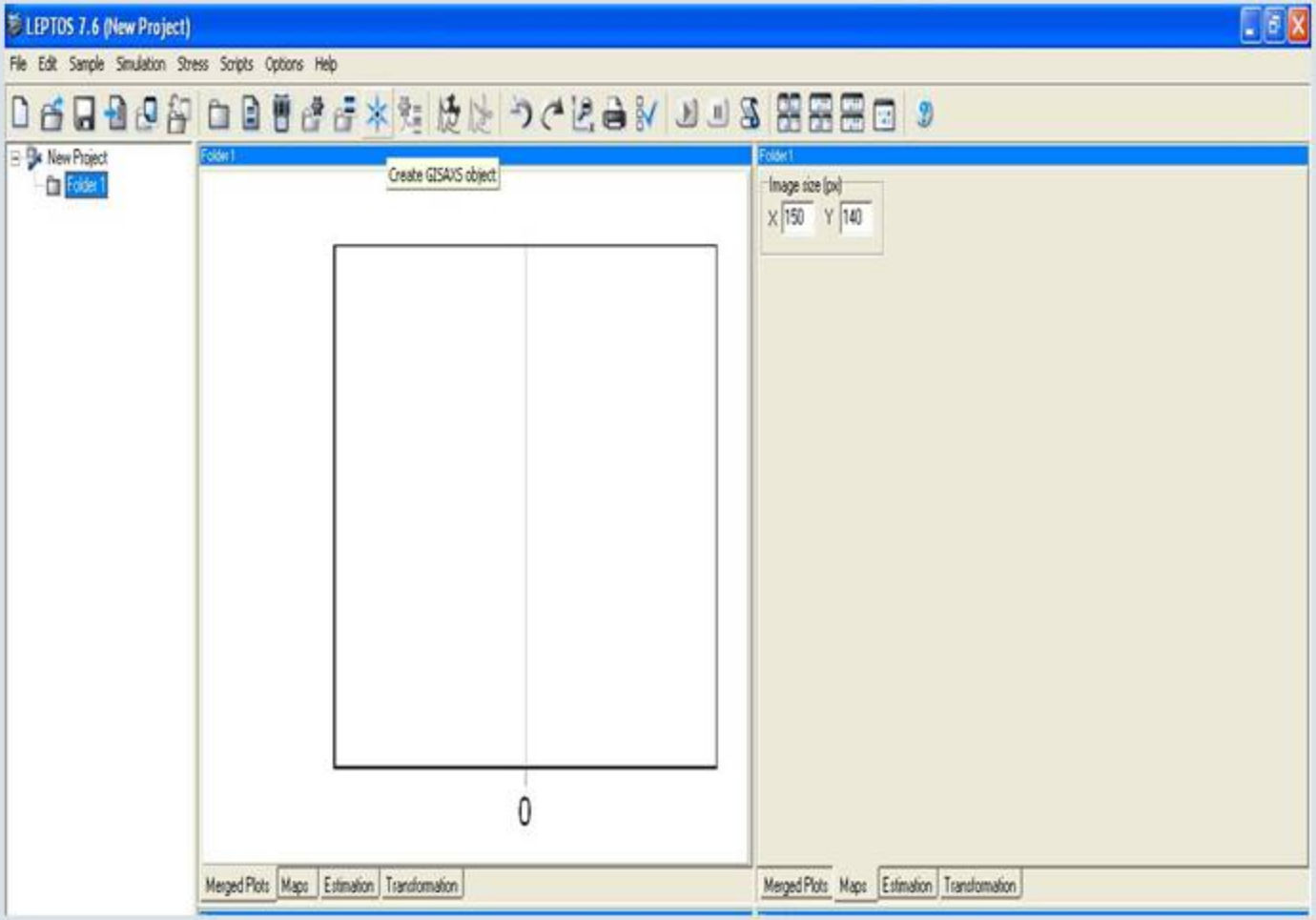
1. 轉換Pixel to 2 Theta
Process>Spatial>Unwarp

2. 在First input frame filename 選擇要轉換的檔案
3. 在First output frame filename選擇存放的位置及檔案名稱
4. 按"OK"

十二、GISAXS Experiment-Integration

1. 打開桌面上的 LEPTOS 7

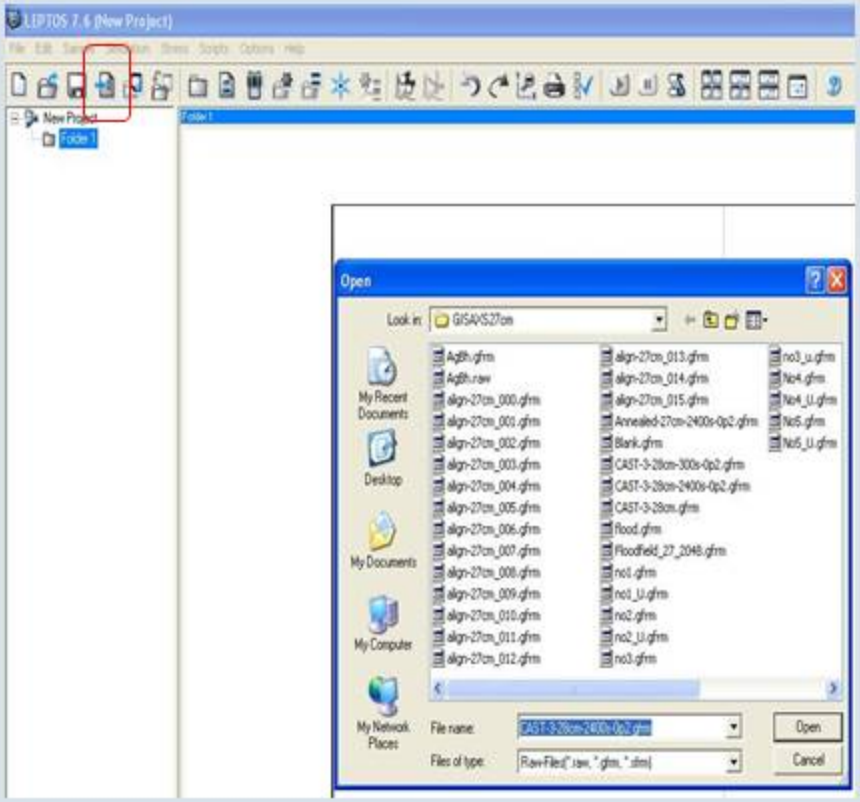
2. 點選 Create GISAXS project

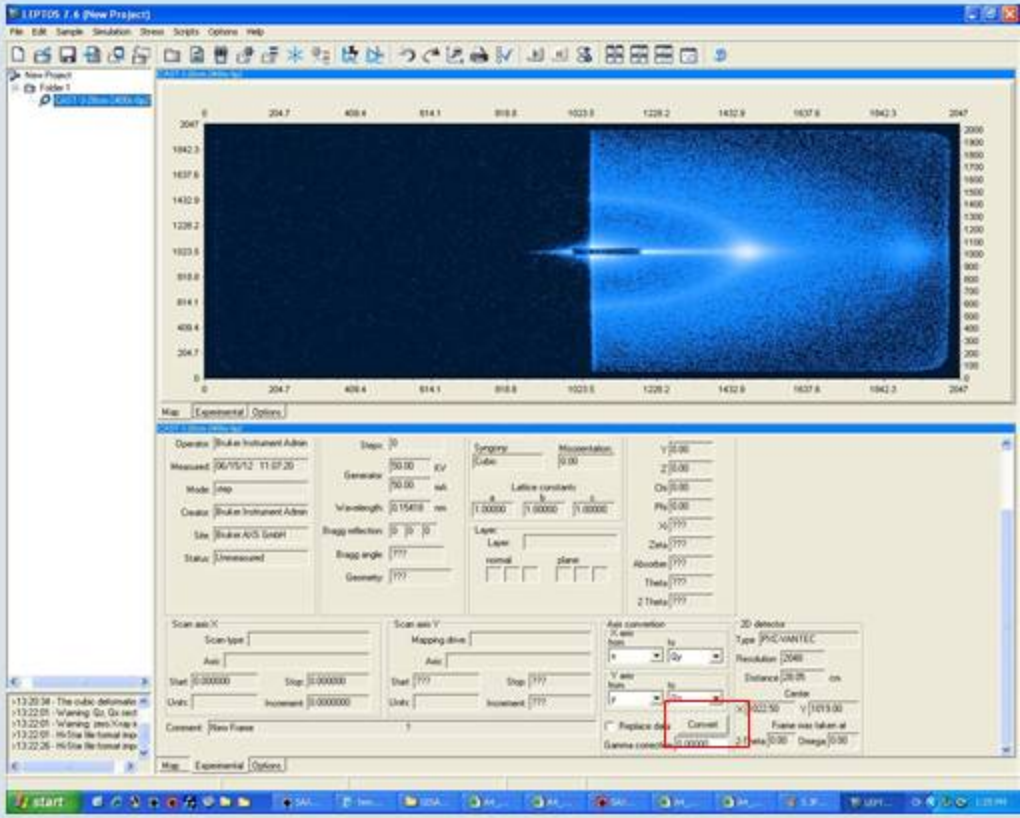


十二、GISAXS Experiment-Integration

3. Import Raw File,
選擇要積分的檔案

4. Convert，轉換單位

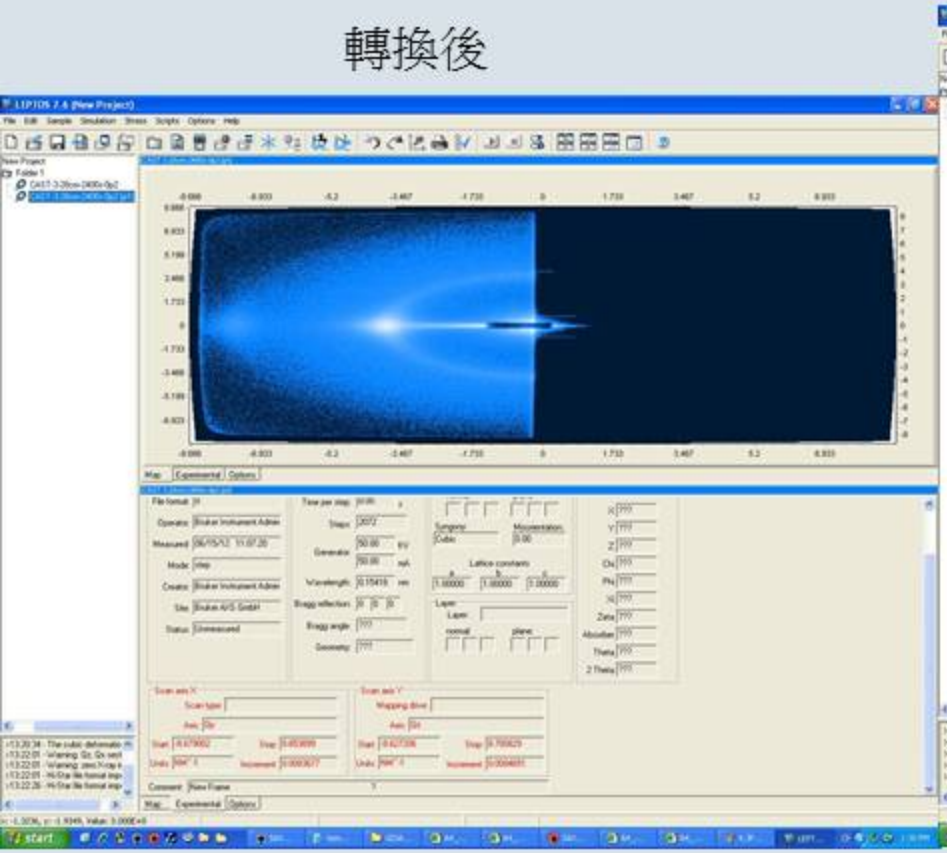


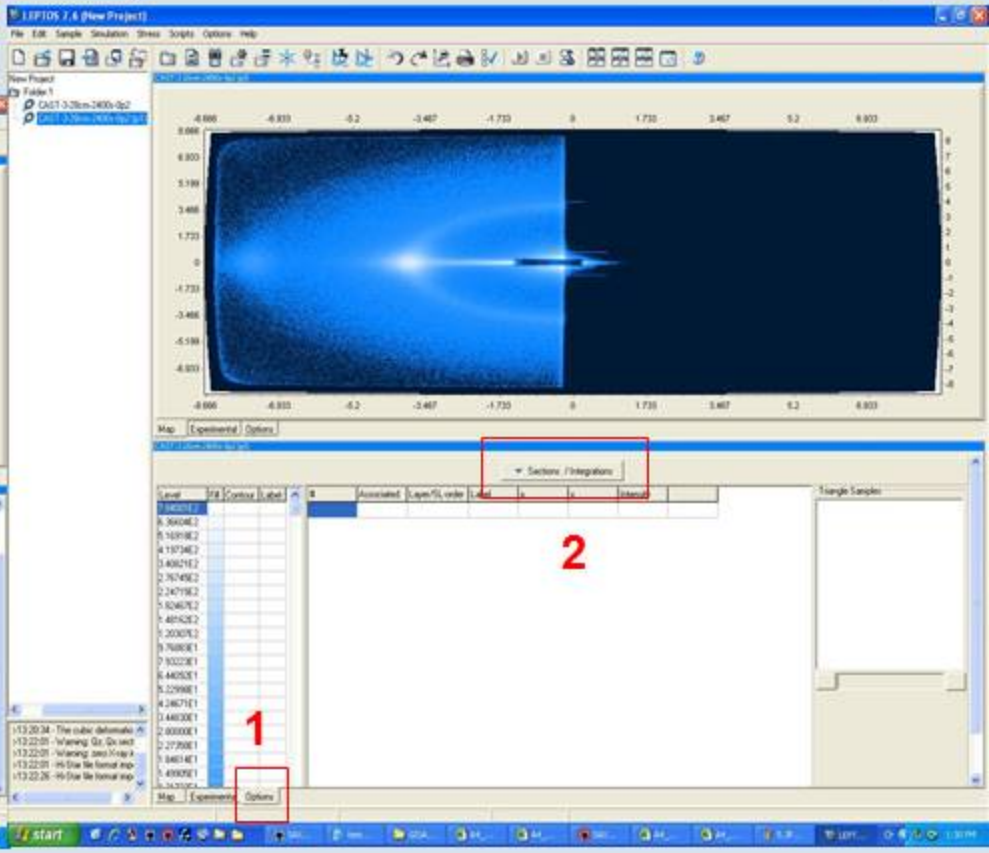


十二、GISAXS Experiment-Integration

5. 切換至options 然後選 sections / Integrations

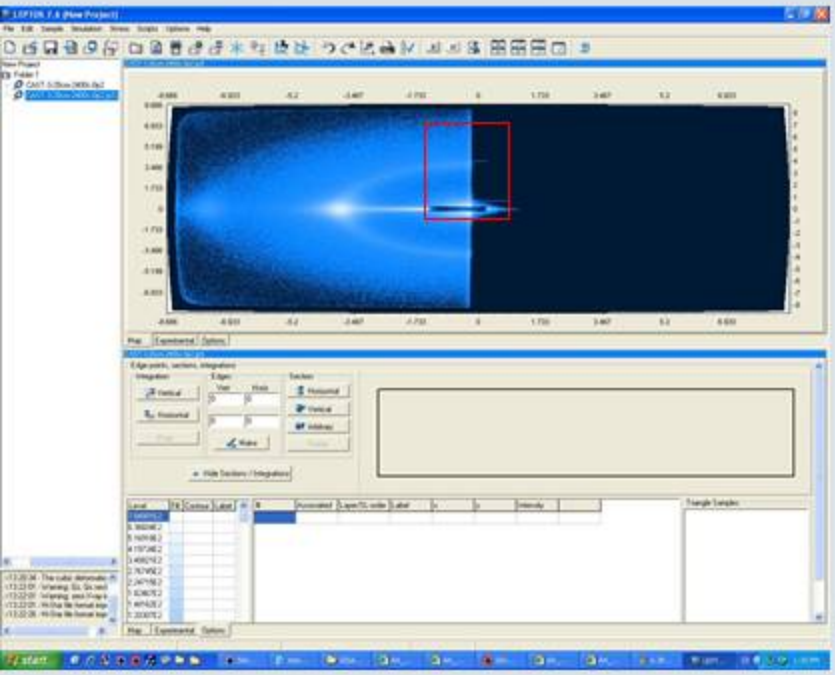
轉換後



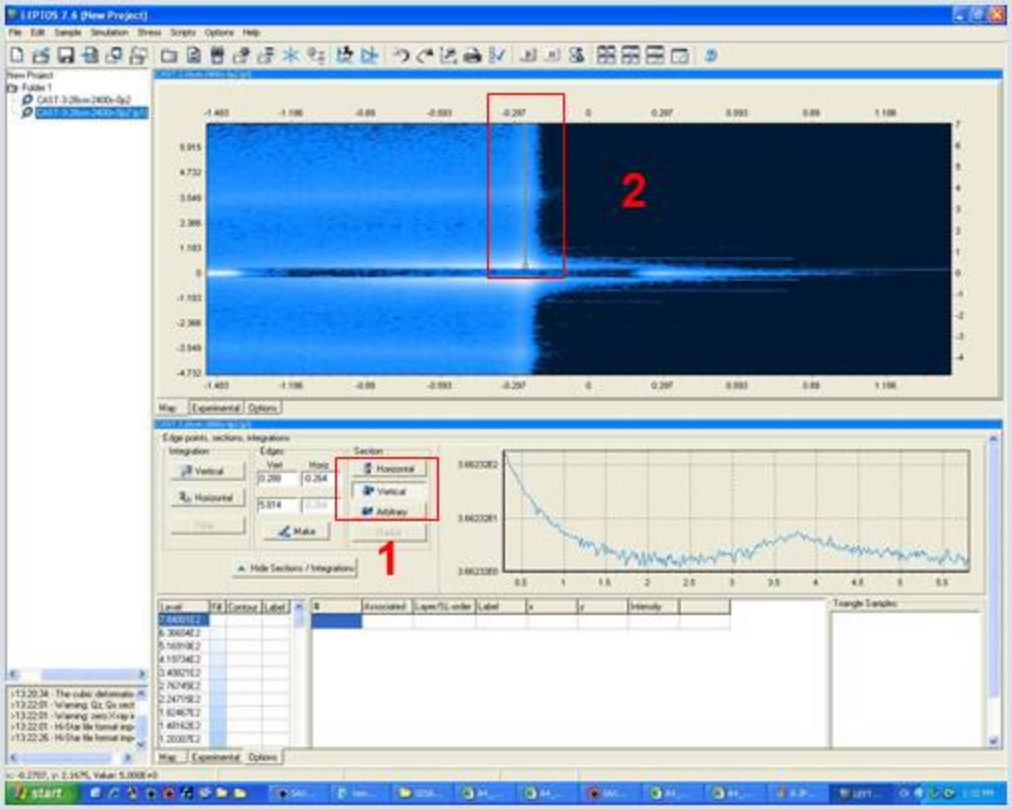


十二、GISAXS Experiment-Integration

6. 利用滑鼠左鍵選擇
要放大的地方

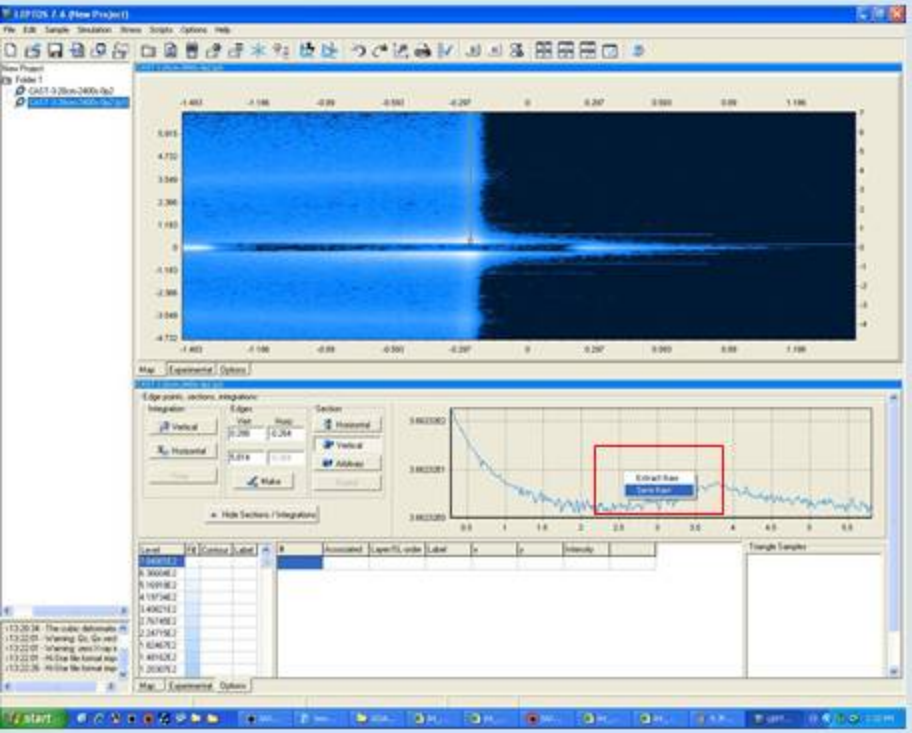


7. 選擇積分的方向(Vertical / Horizontal)
8. 在map裡移動定位線要積分的範圍



十二、GISAXS Experiment-Integration

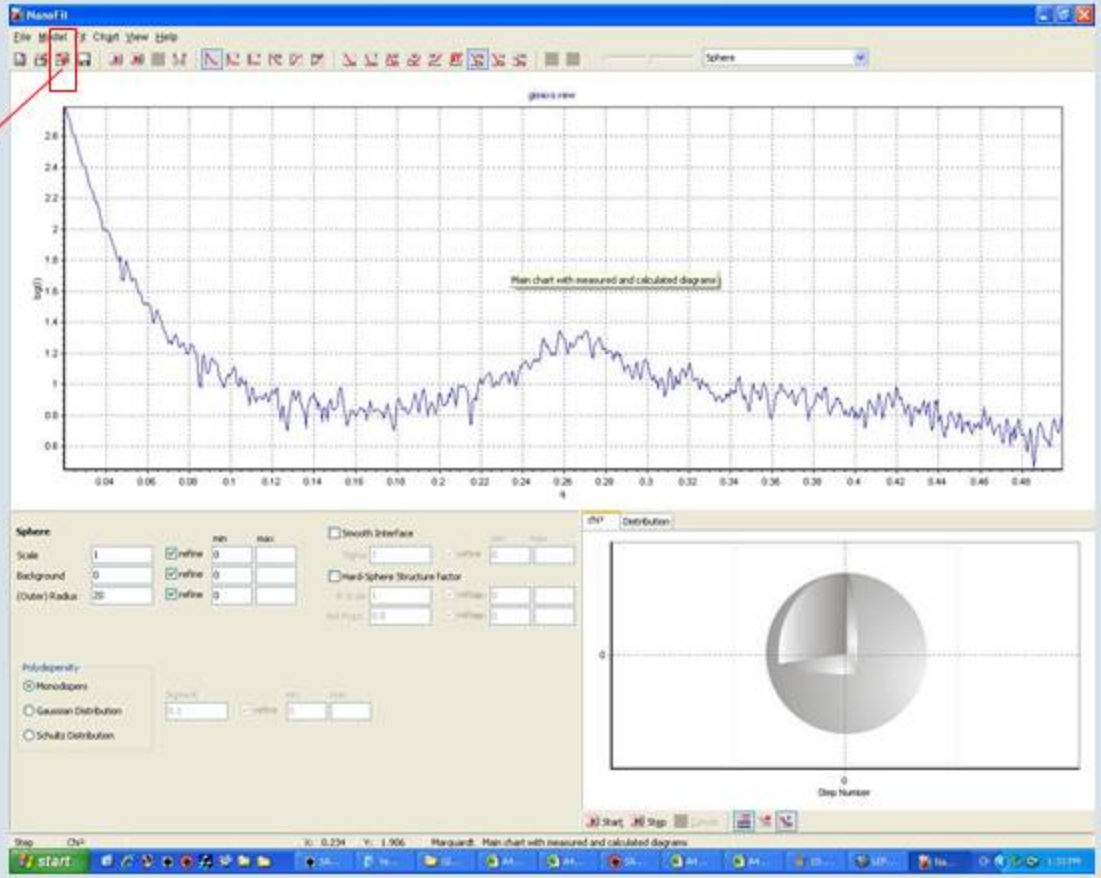
9. 在下方Curve裡按滑鼠右鍵，
接著選擇”Save Raw”



10. 打開桌面上的
“ NanoFit” 軟體

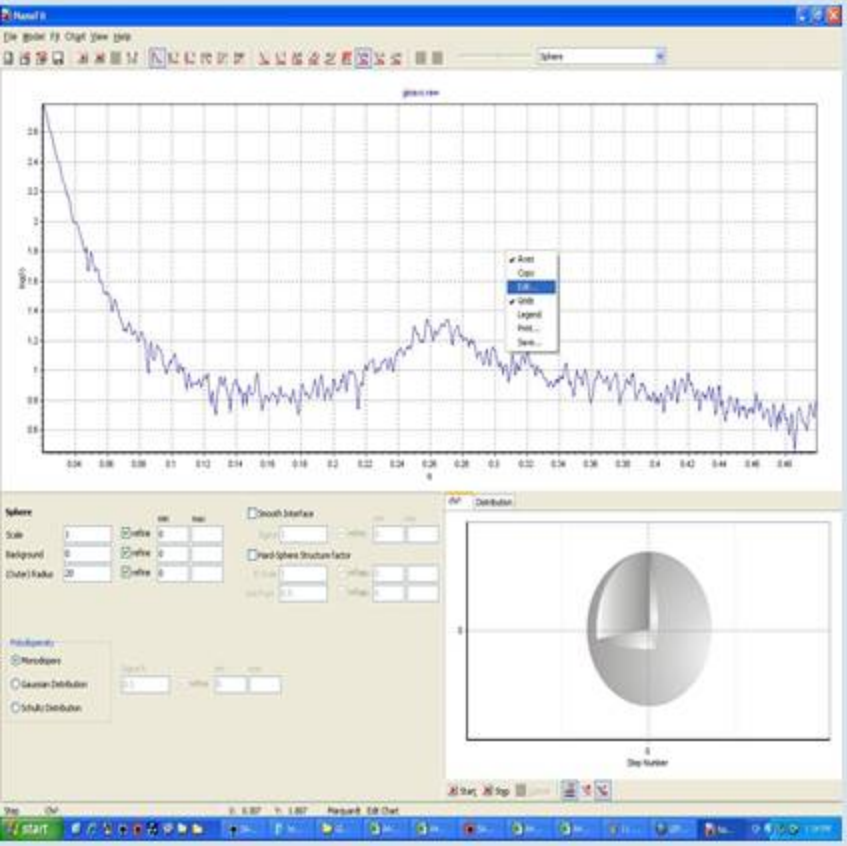
十二、GISAXS Experiment-Transfer

11. 選Import Raw，
然後選擇要轉檔的
檔案



十二、GISAXS Experiment-Transfer

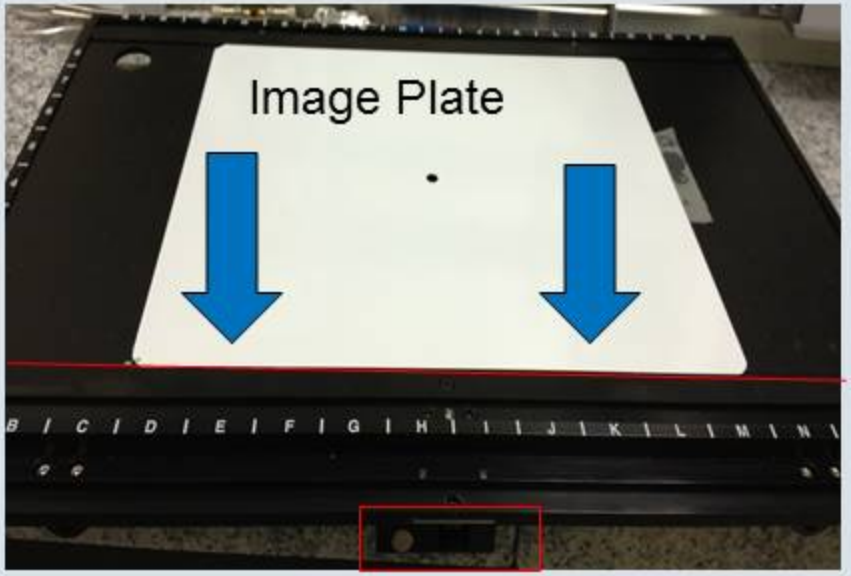
12. 在圖譜上按滑鼠右鍵>edit



13. Export > Data

十三、Image Plate

1. 將IP往磁鐵的方向靠攏

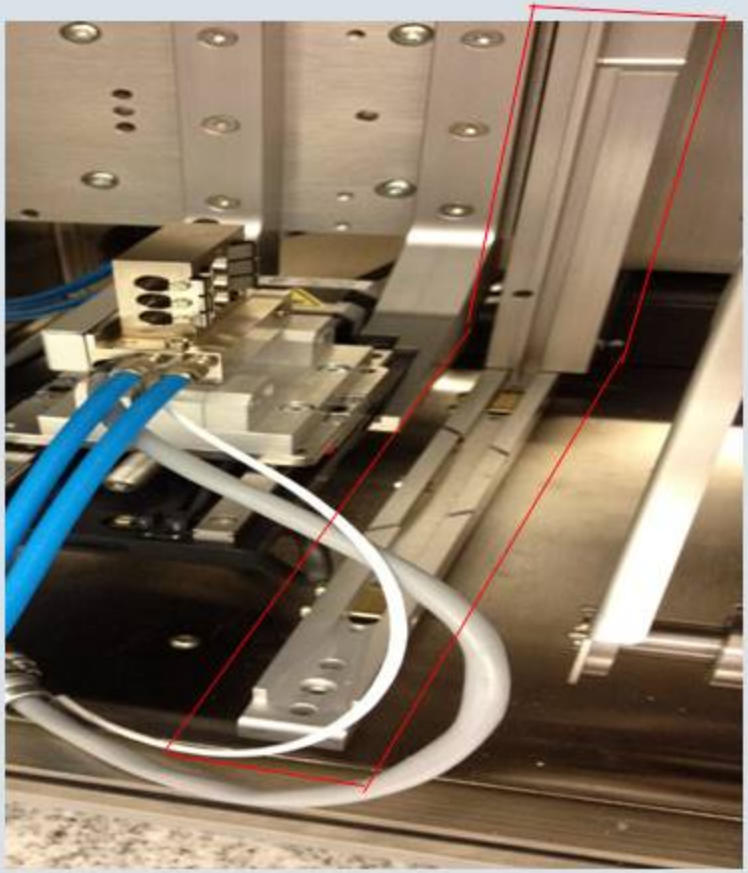


磁鐵

2. 將IP holder放在Eraser上，如圖示
3. 蓋上蓋子
4. 打開定時器
5. 靜待5分鐘以上然後取出，取出時必須無光害

十三、Image Plate

IP 在chamber內的軌道



6. 將IP 的磁鐵朝內握把朝左置入chamber內的軌道，然後推到底，置入及量測時也必須無光害

十三、Image Plate

7. 打開IP Reader的開關

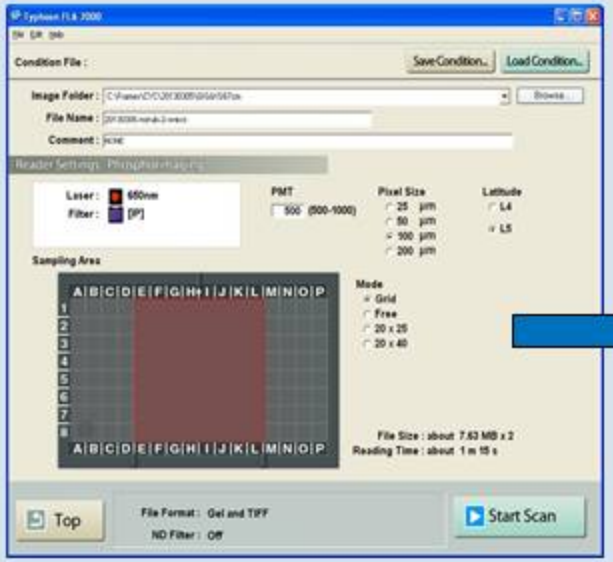
8. 將IP置入Reader內，如圖示，從chamber取出到置入Reader時也必須無光害

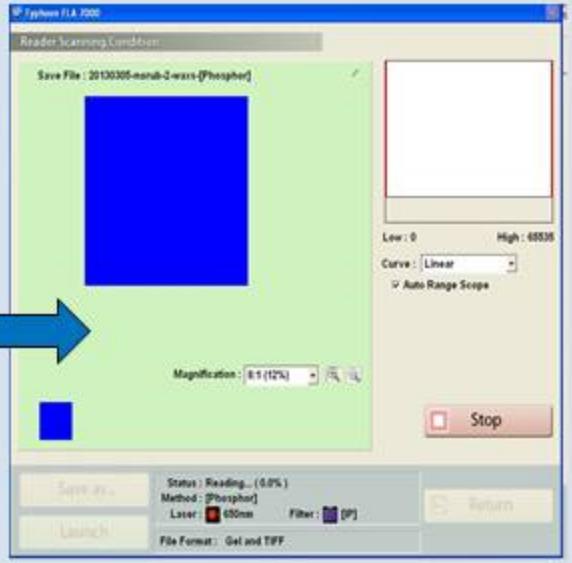
十三、Image Plate

1. 打開桌面上的軟體”
Typhoon FLA 7000

2. 選擇Phosphorimaging

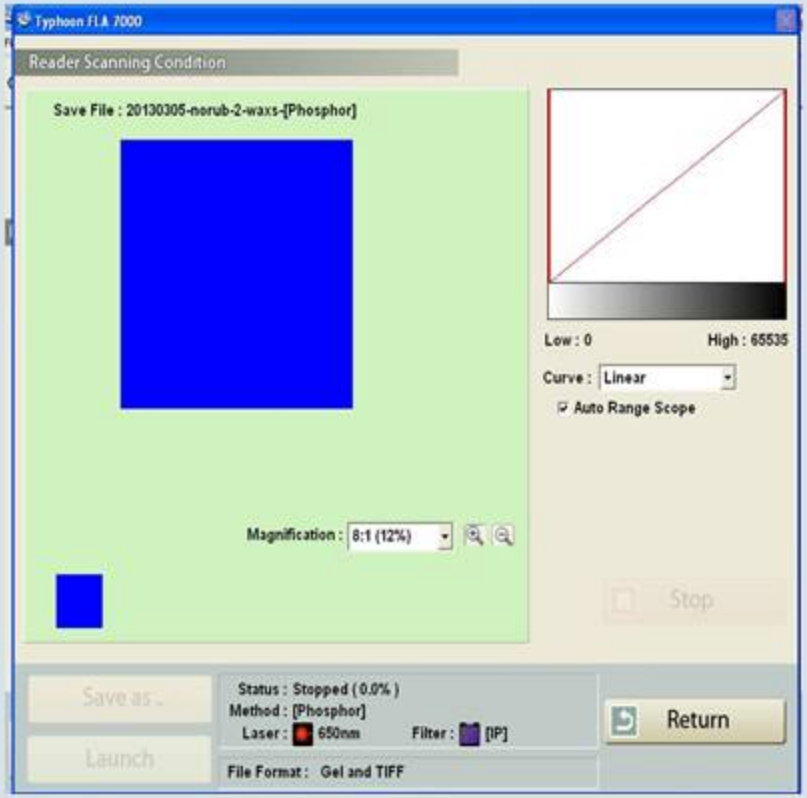
3. Image Folder : 存檔位置(必須存放在C:\ Frames裡)
4. File Name : 存檔名稱
5. Start Scan





十三、Image Plate

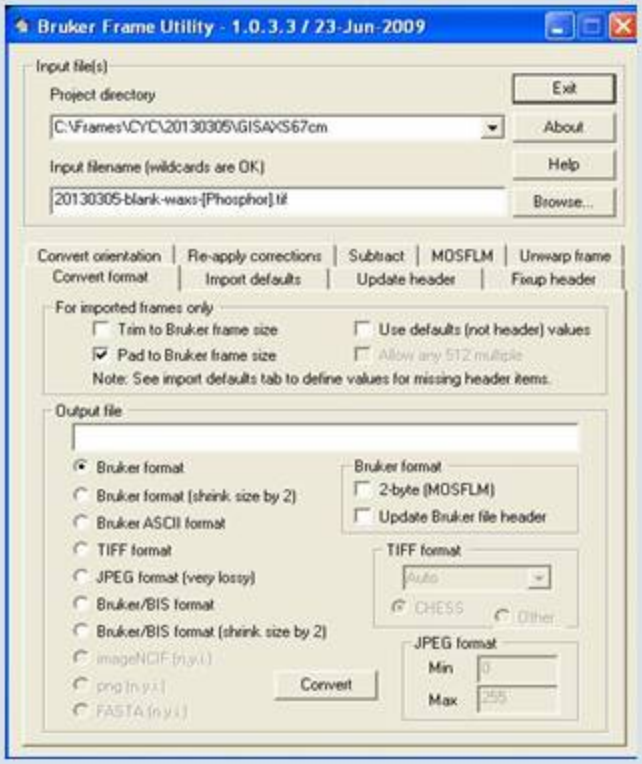
6. Scan 結束後，按Return回上一頁



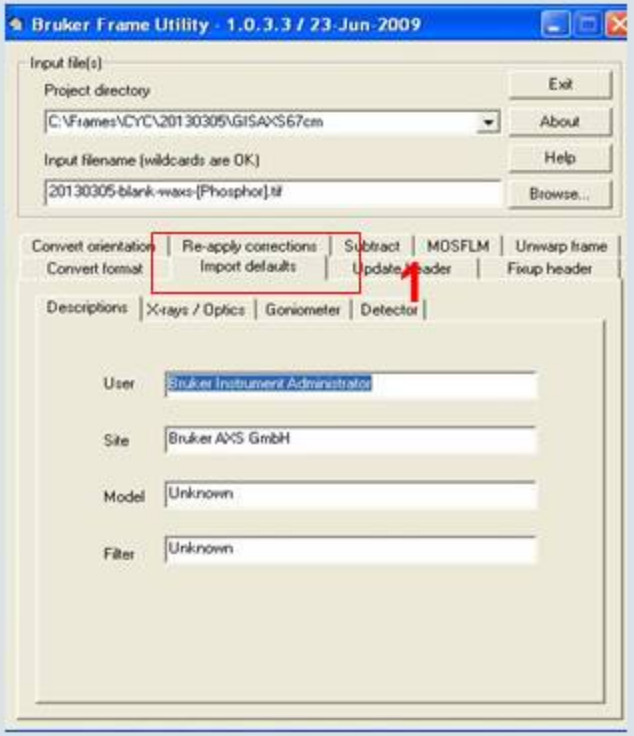
7. 打開桌面上的軟體“ frmutility

十三、Image Plate
gif > gfrm (SAXS軟體才能開啟)

8.選擇project directory(存放IP檔案的路徑
9. 在input filename裡選擇要轉換的檔案

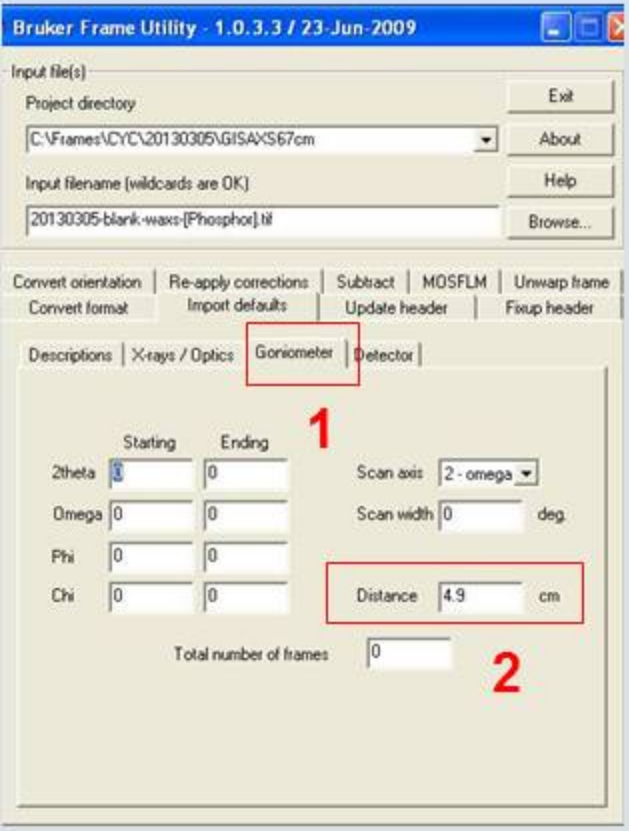


10. 切換到 Import Defaults

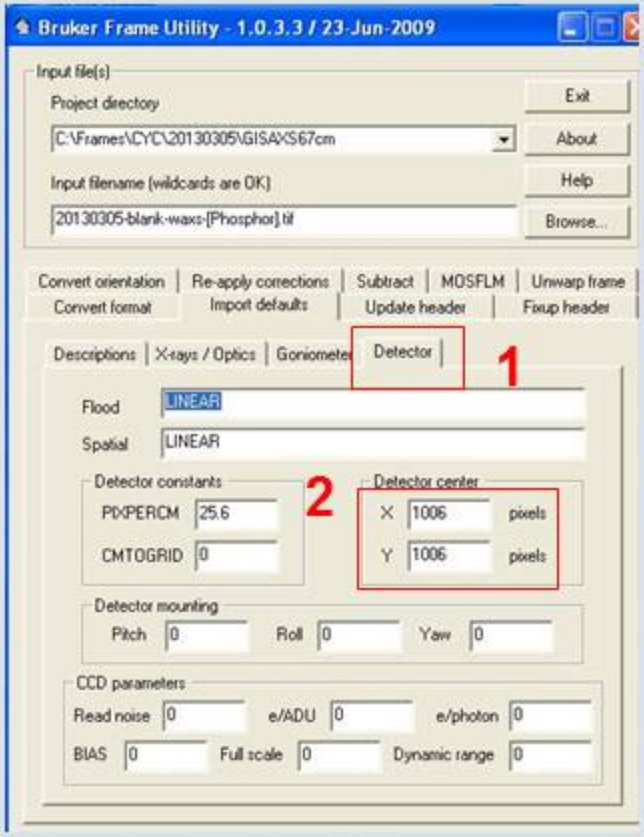
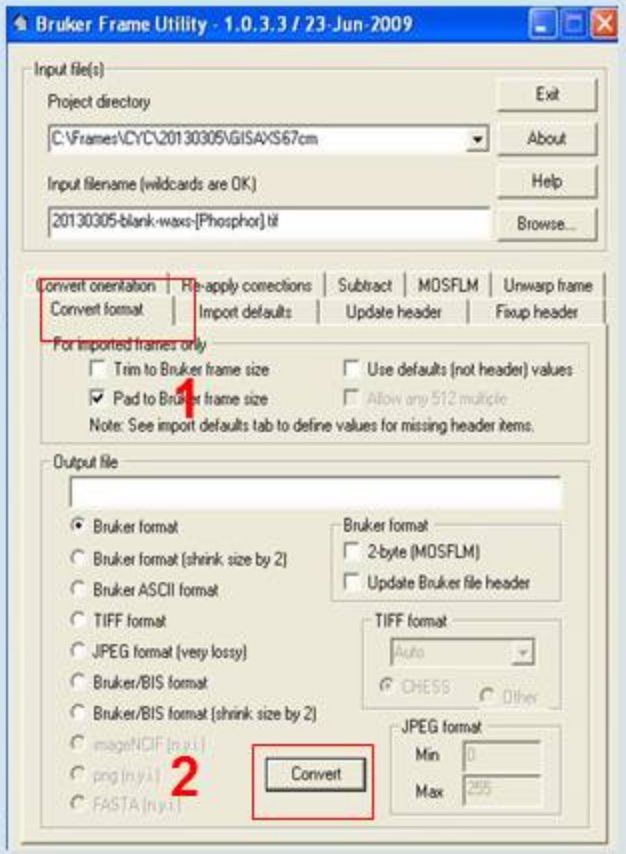


十三、Image Plate

11. 切換“Goniometer”，輸入距離



12. 切換 “Detector”，輸入 X,Y Center



13.切換 “Convert format” 後執行Convert