The SNS Magnetism Reflectometer

Data Reduction Manual



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1. Starting SNS_IDL_TOOLS

1.1. Running from MRAC (BL-4A LINUX Workstation)

- 1.1.1.Sit at the LINUX workstation console in the beam line 4A control cabin and use your XCAMS username and password to log on.
- 1.1.2. Use the Applications pull down menu to select SNS Applications from the Analysis list

Applications Places	System 😔 🚳 🍣
S Accessories	•
Analysis	1) SNS Applications
Graphics Tools and u	tilities to assist in data analysis.
🖏 Internet	9) Help Me
S Office	🖌 🙀 Account Request Page
💕 Programming	🔮 Bayes
[Sound & Video	DAVE
🛃 System Tools	DL Workbench
Add/Remove Software	ISAW
Addition of Solution	
	laueX
	😽 Live Data Processing Monitor
	🌞 MakeNexus
	🧱 Maple
	💥 Matlab 2006
	💥 Matlab 2008
	📣 Matlab 2009
	👷 NX to SNS computers
	III RefScale
	🗿 Windows Apps via Citrix
	XMGrace

As an alternate method you can select Terminal from the Accessories list to bring up a new terminal



and type sns_idl_tools& at the command prompt

11	tterm	- • ×
	[1qg@wrac "]\$ sns_idl_tools& [1] 1305 [1qg@wrac "]\$ ■	

The SNS Application Launcher will appear.

st of applications sorted by:	0 0 0 × Reflectmenter DataMadation Rockage - 13.38	-P
- BatchTeleportation	10	
BSSreduction	LAN MANY NUT AND AN AN AN	
- CLOOPES	BENCH IN BAY MET Protonic will belie a benchy framed) . Hant 12 (1977	
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Desreduction	80410 200-04 (2) for 2019/00 (200-04 (2)	
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- Geometry Generator	Price Darget A.IIIIleti at	
MakeNeXus	Min San Exercised 2000,0 Min San Councily 2000,0 Min San Councily 2000,0 Min San Councily 2000,0 Min San Council Counc	
- NeedHelp		
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- plotASCII	The second	
- plotBSS	Next Set Street Terror	
- plotCNCS	Sergine: 6,05000 Approx 10,000006 red	
plotinstrument	bists dif	F
- plotROI	Dist tigs or Report to man selection	£
realignPCS		
PECoffSpace		
- REFORSPEC		
E-1.3.x versions. Data reduction for REF_L (256x304) a		
High resolution version	Mill and New Designed Selection: General Editor: Resp Dupland	
Low resolution version	Bases IF Interest (801) Feat / Belgrand 2007 ands General service selection -0 Nor	
1.5.x versions. Data reduction for the REF_L with rota	Consequence Develop Bits Rue Ruder: 5408 (nierostation state; entry/01,011) (8	
1.6.x versions. Data Reduction for the REF_M with ne	Not [2] Sec [32	
🕀 REFscale	To With Test (B) (as t (B))	25
- REFscaleOFF		-
SANSreduction		
Instruments	High resolution version of the data reduction for REF_L (256x304) and REF_M (304x25
Peduction		

1.1.3.Select REFreduction, 1.3x version, High Resolution version and click the button at the bottom labeled LAUNCH APPLICATION. The IDL splash window will appear.

IDL 🐼	Virtual Machine
Distribution Platform T	o Run IDL Applications
Upgrade to a development l www.ittvis.com/idl	icense of IDL

1.1.4.Click anywhere on the splash window to continue. The REFreduction main window will appear.

LOAD	REDUCE	PLOTS	BITCH	HODE)	LOG BOOK	1						
DATA] N.	ORMALIZATIO	N]									
WSE OR	Run •	🔷 Archived. 🗇	All NeXus	II Speci	fy Proposal:	IPTS	5000 🛁	-+JPEG				
_							- Nexus	Information Z 0 0 M	1			
								Date: N/A				
								Start: N/A				
								End: N/A				
								Duration: N/A				
								Proton Charge: N/A				
								Min bin (microS): N/A		Max bi	n (microS): N/A	
								Bin size (microS): N/A			Bin type: N/A	
								Dangle: N/A	deg	or	N/A rad	
								Dangle0: N/A				
								Dispise 100		Pafaiu	. No	-
								DICDIX: IAH		Nerp1x;	IN IN	
								Detector-Sample dist	ance: N/A	0		
								Sangle: N/A	deg	or N	/A rad	
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						_						
E01 and Peak	/Background Selec	tion) (ontract Ed	itor E	ange Insp	laued							
Eegion Of 1	interest (R01)]Pe	ak / Eackground 200H	mode] Cr	antent vor	king celection	-> Ymn						
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POI file Na	ane: I				SHAE	ROI FILE						

1.2. Running from the BL-4A User Computer (WINDOWS Workstation)

1.2.1. Use the *Shortcut to MRAC* located in the *Start Menu* to start an NX session to the analysis computer MRAC



1.2.2. Enter your XCAMS username and password to log onto MRAC

NOM	IACHINE	
Login	1qg	
Password		
Session	MRAC	
	Login as a guest user	

1.2.3. Follow the instructions from 1.1.2 - 1.1.4 listed above

1.3. Running from the SNS Portal Web Page

1.3.1.Load the Neutron Science Portal web page: <u>https://neutronsr.us/portal/</u> You will be required to log in

😸 Neutron Science Portal Login - Mozilla Firefox		- 0
Ele Edit View Higtory Bookmarks Icols Help		
C X A Management https://neutrons.us/portal/	🏫 • 🚺 • Geogle	۰ 😳 ۹
W Wikipedia 🐐 webwhos Search 📋 XWHOS 🐐 Inside ORNL Hone 🎇 Dictionary.com 💈 The New York Times 🖪 Los	Angeles Times 🖸 FiveThirtyEight.com: E., 🦸 Chicago Tribune 🛛 Yahool Mail: The best	
V Neutron Science Portal Login		-
	The second s	
NEUTRON SCIENCES	 \$NS	
THE ROLL CHARGE		
Neutron Science	Portal Login	
Username:		
Password		
Login		
http://www.yahoo.com/_ylt=A2I3c2k5M8BMWAYBLiubvZx4;_ylu=X3:DMTJwczimNzVxBGNwb3MDNARIZAMxBGcDZDM2N2Iz	[FkOGUwNDIYjdjODMwNGM3OTV1OGZhMGIEaW50bANLcwRzZWMDaW5fbmV3cwfzbGsDbnr	dzLXRpd 🔒 🖻

- 1.3.2.Log in using your XCAMS account information.
- 1.3.3.Select Linux Apps from the Applications menu.



1.3.4.Select REF_M from the list of SNS instruments

🕘 Neutron Sciences Applications Page - Mozilla Firefox	ma long	
Eile Edit View Higtory Bookmarks Iools Help		
C X & Mineutronsrus https://neutronsr.us/applicitions/instruments/	☆ - 🚼 - Google	۰ 😳 🤉
🐨 Wikipedia 😽 webwhos Search 🗋 XWHOS 🛠 Inside ORNL Home 🕎 Dicionary.com 💈 The New York Ti	mes 🖪 Los Angeles Times 📴 FiveThirtyEight.com: E 🦸 Chicago Tribune 🞯 Yahoo! Mail: The best	
💉 Neutron Sciesce Portal 🛛 🗙 🗹 Neutron Sciences Applications Page x 🛛 🔅		
Applications	Neutron Sciences Applications Page	
Help		
SNS Portal		
SNS Instruments	SNS is operated by <u>ORE Elder Normal Lindentry</u> , a national multiprogram research and overgeners Bailing managed by <u>VT-Bannils, LLC</u> , for the <u>U.S.Department of Bearry</u> <u>Office of Science</u> .	
ARCS	Brivace & Iscutty Dischimers	
BSS		
CNCS		
EQSANS		
REF_L		
REF_M		
SEQUOIA		
Misc		
Bayesian Fitting		
Cambridge SD		
DANSE		
DAVE		
EXPGUI		
FullProf Suite		
GRACE		
ICSD		
ISAW		
LAMP		
laueX +		
https://neutronsr.vs/applications/instruments/ref_m.html		8

1.3.5.Select REFreduction from the list of applications.

W Neutros Sciences Applications Page - Mozilla Firefox		
Eile Edit View Higtory Bookmarks [ools Help		
C X & C interconserve https://neutronsr.u/applications/instruments/	රු - 🛃 - Google	۰ 🚳 ۾
\phantom W Wikipedia 😼 webwhos Search 🗋 XWHOS 😼 Inside ORNL Home 🕎 Dictionary.com 💈 The New York Tim	es 🖺 Los Angeles Times 🖸 Five Thirty Eight.com E 🦿 Chicago Tribune 🎯! Yahoo! Mail: The best	
Keutron Science Portal X Veutron Sciences Applications Page X		(*
Return to Instruments	Neutron Sciences Applications Page	
REF_M		
DAVE	SNS is opened by OptRider National Laboratory, a national multiprogram	
Geometry Generator	research and development facility managed by UT-Barnelle, LLC, for the U.S. Department of Energy Office of Science-	
Make NeXus	Inivary & Security Disclaiman	
Plot R0I		
REFreduction		
REFscale		
https://neutronsr.us/applications/instruments/ref-reduction.html		<u>a</u> 2

1.3.6.Select Launch Reflectometer Reduction Tool (high resolution mode) or (low resolution mode) depending on network speed.

😢 Neutron Sciences Applications Page - Moz	zila firefox	
Eile Edit Yiew History Bookmarks [oo	is Help	
C X & Mass	anneva https://neutronsr.a/applications/instruments/	۰ 😳 🤦
W Wikipedia 😽 webwhos Search 🗋 XWH	OS 🐉 Inside ORNL Home 🎇 Dictionary.com 🖲 The New York Times 🔝 Los Angeles Times 🧕 Five ThirtyEight.com E., 🕐 Chicago Tribune 💇 Yahoo! Mail: The best	
K Neutron Science Portal ×	😻 Neutron Sciences Applications Page x	+
Return to Instruments	LAUNCH Reflectometer Feduction Tool (high resolution mode)	Ê
015 H	LAUNCH Reflectometer Reduction Tool (low resolution mode)	Б
	LAUNCH Reflectometer Reduction Tool (v15) (high resolution mode)	
DAVE	LAUNCH Reflectometer Reduction Tool (v15) (lowresolution mode)	
Geometry Generator	LAUNCH Reflectometer Reduction Tool (v16) (high resolution mode)	
Make NeXus	LAUNCH Reflectometer Reduction Tool (v16) (low resolution mode)	
Plot R0I		
REFreduction	Poficitamater Poduction Teal (high recolution mode)	
REFscale	Kenectometer Reduction Tool (high resolution mode)	
	Data Reduction GUI for the Reflectometers.	
	LOAD REDUCE PLITS BATCH MODE LOG BOOK	
	DATA NORHALIZATION	
	DATA RUN NUMBER: 2525 Archived GALL Nexus NX SUN Norty Z 0 0 H	
		A DESCENT
		1. B. Oak
		No. a
		1. 8 1
		Sec. Ca
		1. Jack
		1. A. S.
		14 M M
		et south
		1940 a.
		6.5 16
		-
Done		1 B

1.3.7.You may receive noticed that the NoMachine plug in must be installed. Follow the instructions to install the plug in. You will be notified when your session is ready to run.

Ø	The session is ready to run. Click on the button to start.
NOMACHINE	
	Continue Cancel

1.3.8.Click Continue. You will be asked for your log in information again.

MX - idl-d	reduc		×
NOM	ACH	INE	
Login			
Password			
	Login a	as a guest user	
Configure		Login	Cancel
	_		

The IDL splash window will appear.

🗱 IDL	Virtual Machine
Distribution Platform To	Run IDL Applications
www.ittvis.com/idl	
	Click To Continue

1.3.9.Click anywhere on the splash window to continue. Select Magnetism Reflectometer (REF_M) in the Instrument Selection Window and click VALIDATE INSTRUMENT.

Instument Selection
SELECT YOUR INSTRUMENT
\diamond Liquids Reflectometer (REF_L)
♦ Magnetism Reflectometer (REF_M)
VALIDATE INSTRUMENT

The REFreduction main window will appear.

flectometer Data Reduction Package - 1.3.49	
LOAD REDUCE PLOTS BATCH MODE LOG BOOK	
DATA NORMALIZATION	
OWSE OR Run # [Archived, All NeXus I Specify Proposal:	IPTS-TXX - IPTS
	Nexus Information Z 0 0 M
	Date: N/A
	Start: N/A
	End: N/A
	Duration: N/R
	Proton Charge: N/H
	Rin tine (Ricros): N/R Rin tune: N/R
	Dangle: N/A deg or N/A rad
	Tanola0: N/R
	Dirpix: JVN Ketpix: JVH
	Detector-Sample distance: N/A
	Sangle: N/N deg or N/A rad
	I N F O
	F. F
EDL and Peak/Dackground Selection Contract Editor Range Displayed	
Pegron Of Interest (BDI) Peak / Background 2008 mide (unrent working selection -> Term	
Ymnt I Ymaxt I OF. LOHD ROI FILE	
Dil iste Manet I SAVE DIL STIE	
Source and the	
Y up TOE (Y up TOE (20) Y up Y (20) Y up Y (20)	

2. Loading Data

- 2.1. Verify that the tab labeled Load in the top tier and the tab labeled DATA in the second tier are selected. Verify that the button above the display area labeled Archived is selected.
- 2.2. Enter the number of the run to be reduced in the box labeled Run # and press enter. A window will appear asking you to select a polarization state:

Select a Polarization State: (REF_M_6183.nxs)		
♦ 0ff_0ff		
∲ Off_On		
⇔ On_Off		
⇔ 0n_0n		
CANCEL VALIDATE		

2.3. Select the desired spin state and click VALIDATE. The selected spin state will be displayed.

flectometer Data Reduction Package - 1.3.49	
P	
LARD REDUCE PLOTS BATCH HODE LOG BOOK DATA VOR HALIZATION	
80MSE OR Run • 6188 Archived. ~ All NeXus I Specify Proposal:	X: 587 Y: 88 COUNTS: 0
	Nexus Information Z 0 0 M
	Start+ 13-47-12 (2009-12-17)
	End: 14:17:53 (2009-12-17)
	Duration: 622.673s
	Proton Charge: 3,60601e+11 pC
	Min bin (microS): N/A Max bin (microS): N/A
	Bin size (micrwS); N/A Bin type: N/A
	Dangle: 2.78807 deg or 0.0486610 rad
	Dangle0: 2.7%807 degrees (0.0486610 rad)
	Dirpix: 220,000 Refpix: 1/A
	Detector-Sample distance: 2340.00 millimetre
	Sangle: 11/1 deg or 11/19 rad
	INF0
RDI and Peak/Background Selection Contrast Editor Range Displayed Region OF Interest (RDI) Peak / Background 200H mude Current working selection -> Ymin	
Ynin: I Ywxx: I OR LOAD ROI FILE	Dpenning DRTR Run Number: 6183 (polarization state: entry-Off_Off) 0K
ROI file Name: T/results/REF_M_6183_data_roi.dat SHVE ROI FILE	
X vs TOF (3D) Y vs X (2D) Y vs X (3D)	

- 2.4. Click the tab at the bottom of the window labeled Range Displayed and click on the button at the bottom labeled Linear to activate the pull down menu.
- 2.5. Select Log to change the display to logarithmic scale.

LUAD] REDUCE]	PLOTS BATC	H MODE LOG BOO	k]		
ISE OR Run # 6183		⊒ Specify Proposal:	IPTS-7200	→ JPEG	X: 302 Y: 5 COUNTS: 0
				Nexus Information Z 0 0 M	
				Bate: 2009-1	2-17
				Start: 13:47:	12 (2009-12-17)
				End: 14:17:	53 (2009-12-17)
				Buration: 622.67	3s
				Proton Charge: 3,6060	1e+11 pC
				Min bin (micrwS): N/A	Max bin (microS): N/A
CT PARTY				Bin size (microS): N/A	Bin type: N/A
				Dangle: 2.78807	deg or 0.0486610 rad
				Iangle0: 2,78807 degrees	s (0.0486610 rad)
				Dura (10 000	Decure Non
				DIPPIX: 1220.000	Ketpix: JP/H
				Detector-Sample distanc	ce: 2340.00 millimetre
				Sangle: N/W	deg or N/A rad
			l i		INFO
				L	
ROI and Peak/Background Selection	Contrast Editor	Range Displayed			
X-axis Min: 0.00000 Max:	50,000	RESET X-AXIS			
Y-axis Hin: 0.00000 Hax: 3	03.000	RESET Y-AXIS	FULL RESET	Dpenning DATA Run Number: 6183	(polarization state: entry-Off_Off) OK
Z-axis	11near	DECET 2-ONTO			

- 2.6. Select the tab at the bottom labeled ROI and Peak/Background Selection.
- 2.7. Select the tab labeled Region Of Interest (ROI)

ROI and Peak/Background Selection	Contrast Editor 📔 Range Displayed 📄
Region Of Interest (ROI) Peak / Backs	around ZOOM mode Current working selection -> Ymax
Ymin: I Ymax: I OR	LOAD ROI FILE
ROI file Name: Tresults/REF_H_6185.	data_ron.dat SHVE ROI FILE

2.8. Using your mouse place the cursor at the minimum position of the signal region. Note in the upper right corner of the REFreduction window the cursor position is displayed.

X: 175	Y: 188	COUNTS: 0	
1			

2.9. The Y value is the minimum pixel of the signal region. This value may be typed directly into the Ymin box or may be entered automatically by clicking the left mouse button. A white line will appear in the display to show the current value of Ymin. This value may be modified by editing the number in the Ymin box.

2.10. Repeat this process for Ymax. The display will now show two white lines indicating the region of interest.

DATA NORMALIZATION	6 200K
0455 08 Bun • 5185 Anchived. All NeXus I Specify Provo	
	Nexus information 2 0 0 H
	Start: 13:47:12 (2009-12-17)
	End: 14:17:53 (2009-12-17)
	Duration: 622.673s
	Proton Charge: 3.60601e+11 pC
- In the second second	Min bin (microS): N/A Max bin (microS): N/A
	Bin size (micrwS): N/A Bin type: N/A
	Dangle: 2,78807 deg or 0.0486610 rad
	Dangle0: 2,7807 degrees (0.0486610 rad)
	Birpix: 220.000 Refpix: 190.000
	Detector-Sample distance: 2340.00 millimetre
	Sangle: 0.737/36 deg or 0.00446718 rad
	Selection HELP
1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	Use U(up) or D(down) to move selection vertically pixel per pixel.
and the second	
Parton OF Interest (POI) Pask / Background 2008 and Digrant working sal	lection -> Ymax
region of the est (not) free / background toon moet Cartano as king of	
Ymin: 188 Ymax: 132 OR LOAD ROI FIL	E Depending DATA Run Number: 6183 (polarization state: entry-Off_Off) OK
ROI file Name: ["/results/REF_M_6183_data_roi.dat	SAVE ROI FILE

- 2.11. Make adjustments to the Ymin and Ymax values and when satisfied click the button labeled SAVE ROI FILE.
- 2.12. Go back to the Peak/Background tab and click the button labeled Background.

Region Of Interest (ROI) Peak / Ba	kground ZOOM mode Current working selection -> Ymax
💠 Peak \land Background	
Ymin: I Ymax: I OR	LOAD BACKGROUND SELECTION FILE
Back. File Name: Moreculte/PEF_H_	185_data_back.dat

2.13. Repeat the processed you just used for the signal and select Ymin and Ymax values for the background region.

LORD REDUCE PLOTS BITCH HODE LOG BONK DATA NORMALIZATION MSE OR Run • 6183 Archived, ~RIINeXus ISpecify Proposal: IPTS=RC00	
LOAD REDUCE PLOTS BYTCH HODE LOG BOWK DATA NORMALIZATION MSE OR Run • 6185 Archived, \$\sigma R11 NeXus I Specify Proposal: 1975-7500	
MSE OR Run • 6185 Archived, ~R11 NeXus I Specify Proposal: IFTS-R200	
	X: 91 Y: 2 COUNTS: 0
	Nexus Information Z 0 0 H
	Date: 2009-12-17
	Start: 13:47:12 (2009-12-17)
	End: 14:17:53 (2009-12-17)
	Duration: 622.673s
	Proton Charge: 3.60601e+11 pC
	Min bin (microS): N/A Max bin (microS): N/A
	Bin size (wicroS): N/A 3in type: N/A
	Dangle: 2,78807 deg or 0.0486610 rad
	Banole0* 2,78807 decrees (0.0486610 rad)
	Dirpix: 220,000 Refpix: 190,000
	Detector-Sample distance: 2340.00 millimetre
	Sangle: 0.257096 deg or 0.00448718 rad
	0.1
	Selection HELP
	Use U(up) or D(down) to move selection vertically fixel per pixel.
RDI and Peak/Background Selection Contrast Editor Range Displayed	
Region Of Interest (ROI) Peak / Background 200H mode Current working selection -> Ymax	
	- J
Ymin: 70 Ymax: 120 OR LORD BICKGROUND SELECTION FILE	Dpenning DATA Run Number: 6183 (polarization state: entry-Off_Off) OK
Back, File Name: [//results/REF_M_5183_data_back.dat	

- 2.14. Click the button labeled SAVE BACK. FILE when satisfied with the settings.
- 2.15. Switch to the tab labeled NORMALIZATION.
- 2.16. Enter the run number of the direct beam measurement.
- 2.17. Repeat the process used previously for Data runs.

3. Reducing Data

3.1. Switch to the tab labeled REDUCE in the top tier.

Reflectometer Data Reduction Package - 1.3.49	
HELP	
HELP LUAD REDUCE PLOTS BATCH HODE LDG BOOK D A T A Rum:: [JSKS/REF_H/IPTS-2413/57/6183/He/us/REF_H_6183,nxs Region of interest (ROI) file: "/results/REF_H_6183_ista_roi.dat Background Selection File: '/results/REF_H_6183_data_back.dat Background: \diamond Yes \diamond No TOF cutting: min: I max: N O R H A L I Z A T I O N A Yes No Rum:: [YSKS/REF_H/IPTS-2413/57/6198/He/us/REF_H_6198,nxs Region of interest (ROI) file: "/results/REF_H_6198_norm_roi.dat Background Selection File: '/results/REF_H_6198_norm_back.d Polarization state: \diamond Same as Bata File \diamond Off-Off	INTERMEDIATE PLOTS Data Combined Specular TOF Plot Data Combined Background TOF Plot Data Combined Subtracted TOF Plot Normalization Combined Background TOF Plot Normalization Combined Subtracted TOF Plot Normalization Combined Subtracted TOF Plot Normalization Combined Subtracted TOF Plot Normalization Combined Plot Normalization Combined Plot COMMEND LINE GENERATOR STATUS REDUCTION XML FILE
Argle Offset Angle Value: N/A Value: I +/- I */- */- */- */- */- */- */- I */- */- */- */- */- */- */- */- */- */- */- */- */- </td <td>REDUCTION STATUS</td>	REDUCTION STATUS
Overwrite Normalization Instrument Geometry: Yes No Output "/results/ File Name: FEF_M_6183,2010g_10m_19d_15h_12m_24e,txt Preview of the Command Line (CL) File Name: File Name:	Repeat reduction for other spin states? \$ yes \$ no Configure >>>>START DATA REDUCTION < <
[prun -1 -p mracq reflect_reduction /SNG/REF_H/IPTS-2419/57/6183/NeXus/REF_H_S183.nosdata-paths-/entry-Off.Off/bank dbkg-roi-file="/results/REF_H_S183.data_back.dat -=scat-angle=0.0082473.0.00000_units=radiansnorm=/SNKREF_H/ -norm-data-paths=/entry-Off.Off/bank1.1norm=roi-file="/results/REF_H_S183.nosdata-paths=/entry-On_HF/bank1 obkg-roi-file="/results/REF_H_S183.data_back.dat -=scat-angle=0.0082473.0.00000_units=radiansnorm=/SNKREF_H/ obkg-roi-file="/results/REF_H_S183.data_back.dat -=scat-angle=0.0082473.0.00000_units=radiansnorm=/SNKREF_H/ norm-data-paths=/entry-Off/bank1.1norm=roi-file="/results/REF_H_S183.nos-units=REF_Hnorm=roi-file="/results/REF_H_S183.nos-units=REF_H_S183.nos norm-data-paths=/entry-Off/bank1.1norm=roi-file="/results/REF_H_S183.nos-units=REF_H_S183.nos norm-data-paths=/entry-Off/bank1.1norm=roi-file="/results/REF_H_S183.nos-units=REF_H_S183.nos norm-data-paths=/entry-Off/bank1.1norm=roi-file="/results/REF_H_S183.nos-units=REF_H_S183.nos-units=REF_H_S183.nos norm-data-paths=/entry-Off/bank1.1norm=roi-file="/results/REF_H_S183.nos-units=REF_H_S183.n	1.1data-roi-file="/results/REF.H.5183.data_roi.dat PIS-243/57/5183.MeWux/REF.M.5183.mxs results/REF.M.5183.2010g_10m_134_15h_12m_21s_Dff_0ff_txt 1.1data-roi-file="/results/REF_M.5183.data_roi.dat PIS-243/57/5183.MeWux/REF_M.5183.nxs results/REF_M.5183.2010g_10m_13d_15h_12m_21s_Dn_0ff_txt
UL DIRECTURY OR 1/REFreduction_UL/ AND CL FILE OR FEFreduction	CREATE COMMAND LINE FILE

- 3.2. If all necessary information is present the button labeled START DATA REDUCTION will be active. If this button is not active, the command line generator status window will display messages regarding what additional steps are required.
- 3.3. Verify the NORMALIZATION: Yes button is selected.
- 3.4. Verify the Background: Yes button for both DATA and NORMALIZATION is selected.
- 3.5. Verify the Repeat reduction for other spin states: Yes button is selected and click the Configure button:

Repeat	reduction for following spin states:
	E Off-Off ⊒ Off-On
	IE On-Off ⊒ On-On

- 3.6. Select all the spin states measured for this data (the default is Off-Off and On-Off). Click CLOSE when done.
- 3.7. Edit the file name if desired.

- 3.8. Click the START DATA REDUCTION button.
- 3.9. Once you are finished reducing the data switch to the label BATCH MODE. You will see all the files you have processed listed. Order them in ascending order by using the buttons MOVE UP SELECTION and MOVE DOWN SELECTION at the bottom. Click SAVE BATCH FILE. You can change the file name and folder if you want.

	AD RETUCE	PLOTS BA	THE MODE LOG BOOK	1			
tive	Data Runs	Bata Spin States	Norm. Runs	Norm. Spin States	Angle (degrees)	Date	SF
YES	8497	Off_Off/On_Off	8493	OFF_OFF/OFF_OFF		02/9/2011:14h59er28:	
YES	8498	Off_Off/On_Off	8493	OFF_OFF/OFF_OFF		02/9/2011:15h00wr51s	
YES	8499	Off_Off/On_Off	8493	OFF_OFF/OFF_OFF		02/9/2011;15h02wr22s	
			Information	Rox of Selected Run Number			
CTIVE DHHANI srun - dbks nors aracq dbks nors	: ^ (ES > NO Da D LINE PREVIEW : 	ta rus: B497 ion /SNS/REF_WIPTS-3445/0/8439 .8497_data_back.datscatt-arg /barki,1norm-roi-file="/res .8497_data_back.datscatt-arg /barki,1norm-roi-file="/res	Bata spin states; OFf_ 7/WeXus/REF_M_8497,nxsdata 1=0.0033354.0.00000,unitsr ME487_FM_8433_norm_roi.da: ME487_rxsdata_paths=/enr 1=0.0033584.0.00000,unitsr uuts/REF_M_8493_norm_roi.da:	Off I Norm, Runs: 8433 paths=/entry-Off_Off/bark1,1data adiansnorm=/SNG/RE_MYIPTS-3445/ inst=REF_Moutput=7/results/REF g/0_0ff/bark1,1data-oi=file=7/ adiansnorm=/SNG/RE_MYIPTS-3445/ inst=REF_Moutput=7/results/REF	Norm. spi -roi-file="//results/REE. 0/0403/NeXus/REE.H_0403 .H_0407_2011g_00m_9d_1 0/0403/NeXus/REE.H_0403 .H_0407_2011g_00m_9d_14	n state: Off_Off Ang .M_8497_data_roi.dat h_55mr_48s_Off_Off.txt ; .roxs h_55mr_48s_On_Off.txt	sle: ? degrees
CTIVE DHHANI srun - dbks nors aracq dbks nors	: ^ /rES ~ NO Da D LINE PREVIEW : 0 -p wracq reflect_reduct; rroi-iie='/results/REF_M -roia-ipatha='/results/REF_M -roi-iie='/results/REF_M -roia-iie='/results/REF_M -roia-iie='/results/REF_M	ta rus: B497 	Data spin states: OFf_ 7/MeXus/REF_M_8497,nosdata]==0,0033584,0,0000,unitas muta/REF_M_8493,norm_rol.da: M_8497,nosdata-pathes/error suts/REF_M_8493_norm_rol.da: R E P O P U L A T E G L	OFF Norm. Runs: B433 paths=/entry=Off_OFf/bark1_1data adiansnorm=/SR/RE_M/IPTS-3445/ instREF_Moutput=7/results/REF yoff/bark1_1data-moi-file=7/ adiansnorm=/SR/REF_M/IPTS-3445/ inst=REF_Moutput=7/results/REF I with SELECTE) ROW	Nrn. spi -roi-file="/results/REF 0/4437/Robus/REF_H_843 H_8497_2011y_0h_31_H 0/4437/Robus/REF_H_849 JH_8497_2011y_0h_34_14	n state: OFF_OFF Ang ML_8437_data_roi.dxt mcs ML_58m_48s_OFf_OFf.txt ; mcs mcs h_55em_48s_On_OFf.txt	gle: ? degrees
HINNE dbks nort dbks nort	: ^ //ES > NO Da D LINE PREVIEW : 	ta rus: B497 ion /SIS/REF_M/IPTS-3445/0/8439 0497_data_back.datscatt-ang /barkl.1norm-roi-file="/res 0497_data_back.datscatt-ang /barkl.1norm-roi-file="/res MM SELECTION DELETE	Data spin states: OFf	OFF Norm, Runs: B433 paths=/entry=Off_Off/bark1_1data adians	Nrn. spi -roi-file="/results/RET 074937/MoNus/RET_H_B43 NLB497_2011y_0h_91_1 NLB497_2011y_0h_94_1 NLB497_2011y_0h_94_14 NLB497_2011y_0h_94_14	n state: OFF_OFF Ang 	ple: ? degrees

4. Scaling Data

- 4.1. Select Refscale from the list of applications (the list where you have selected Refreduction).
- 4.2. Click batch and then Load Batch File. Here you load the file that you have created at the end of the refreduction (previous page)

		REFLECTOMETER RESCALING PROGRAM for I	REF_M - 1.1.0			
	4/-4/	STEP1	: Load STEP2: Critical H	Edge STEP3: Other Files	Output File BATCH	LOG BOOK
		Low	d Batch File	i/users/ha%/results/REF_M	1_Batch_Run_8497_201	PREVIEW
	-	ACTIV	e drta runs	NORH, RUNS	SF	DATE
	F	YES	8497	8493	02/9	/2011;14h59#
		YES	8498	8493	0.106498 02/9	/2011;15h00#
	_	TES	8499	8495	0.00398611 02/5	/2011;15h02#
3						
1						
	16-4					
	F					
	-					
	Ē				,,	
1			SAVE BATCH FILE		SAVE BATCH FILE A	s [
1	l l		C C	(
	-	FULL	RESET REFRESH PLOT CR	EATE OUTPUT FILE email	output? 🔷 Y 💠	N Setup
	-	- X-ax	is min: D	max: 0.0987800		
		Y-ax	is min: .00000e-06	max: 9.25298e-05	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	Keset X/Y
	10 ⁻⁴	0.06 0.08	f_Off ◇0ff_On ◇On_0	Off 💠 OrijOri	Setting	s

4.3. Changing Scale

4.3.1.You will see plots like this that includes all the angles you have measured



- 4.4. Critical edge-Autofitting and Rescaling
 - 4.4.1.Click STEP 2: CRTICAL EDGE and select the flat region as shown. You can enter Qmin and Qmax to select the flat region. Once satisfied with the selection click AUTOMATIC FITTING and RESCALING to normalize the flat region to 1.



4.4.2.Background of the plot can be changed by clicking Settings... you can go between black and white for background color, turn error bars on or off, and configure auto cleaning.

	SETTINGS	_ 0 ×	
A	Auto Cleanning: 🗢 Yes 💠 No	CONFIGURE	
	Show error bars: 🛷 Ye	is √No	
N	Number of data to display in ste	p3: 100	
	Color of background: 🐟 Wh	ite 💠 Black	
	SAVE and CLOSE		

4.5. Load other files



4.5.2.Load the second run



4.5.3.Scale the second run

4.5.3.1. By clicking on the scaling factor arrows you can align or scale the second run to the first. There are three scaling factors indicating how big the jump or scaling is. 1 big the smallest step. You can go between the different spin states to choose the base alignment.



4.5.4.Loading the next run



4.5.4.1. Scaled-you repeat the same thing you have done in the previous scaling.



4.5.5. If satisfied with the scaling click OUTPUT FILE from the menu



- 4.6. Click CREATE OUTPUT FILE
- 4.7. You can also have the output file emailed to you. Click "email output" (Y)es and the "SETUP" button will be active. Click on SETUP and enter your email address when prompted. When you are done "save and close" the window. Click CREATE OUTPUT FILE to have the out files sent to your email address.

5. Plotting Data

- 5.1. Plotting data with GNUPLOT
 - 5.1.1.Once the *IDL* software has finished, you may use *gnuplot* to view the data; type "gnuplot" to start the program and get to the *gnuplot* command line. *Gnuplot* is a versatile plotting package. Obtaining a simple plot requires only the command "plot 'filename'". Note that since your data files will be in the "~results" subdirectory (in my case

/SNS/users/1qg/results) you should change your working directory to your version of that with the command "cd ~/results" prior to starting *gnuplot*. You can include the x and y-ranges in square brackets as shown in the example. Some minor tweaking after the initial look (*plot* [0:1] (*filename.txt*) yields:



The log scale of a selected axis can be set by writing "set log y/x" on the command line.





- 6. Additional Run File Information
 - 6.1. The proton charge for each spin state can be obtained from the preNexus data. For example, run 4551 stores it's preNexus data in directory /SNS/REF_M/IPTS-1307/21/4551/preNeXus/, and the file containing the proton charge information is REF_M_4551_runinfo.xml. You can also obtain all the parameters for your measurement including the proton charge through the portal by going to your proposal/directory. Once you are in the portal (https://neutronsr.us/portal/) for example, you go to /data/SNS/REF_M/IPTS- xxxx/0/#number/NeXus/. Double click on REF_M_#number.nxs. A list of the 4-crossections will be displayed. Select anyone of the spin states you have measured. In DASlogs you will find the list of all the motors. Select a motor and click on value to get the number. Proton charge, duration, end time, and so on are also listed. Select them to get the values.



6.2. Scroll down in the file until you find the lines that say State index="0" and State index="1".These correspond to the p0 and p1 NEXUS files we analyzed. The values stored as PCurrent are the proton charge for each of the spin states.