Directions for using PolCorr2011.exe on Windows

Installation:

0) Install LabVIEW Run-Time Engine 2009 (free at http://joule.ni.com/nidu/cds/view/p/id/1406/lang/en) or simply run the attached executable, LVRTE90min.exe.

1) Use latest NIST SANS Reduction software (or update WriteQIS.ipf in older versions) found at http://www.ncnr.nist.gov/programs/sans/data/red_anal.html to continue processing your polarization corrected data sets, if desired.

2) Make folder PolCorr in your C directory. Copy the entire folder, ModernStyleData, which contains example files into it.

3) PolCorr2011.exe and ProjectD.dll must reside in the same directory of your choosing.

Running the application:

3) Double click PolCorr2011.exe. (If ProjectD.dll is not in the same directory as PolCorr 2011.exe then you will be asked to manually select it.) The default is to start with the example files noted in step 2, and that is what has been used to generate the images you initially view. Note: the first time you run the application you may see null data sets. If this occurs, run again and the condition should not reappear.

4) To run the program hit the single white arrow in the upper left corner once, just under Edit. (Avoid the continuous arrows are this runs the program over and over in a loop). When a successful polarization is completed a message box pops up and will tell you that 'Your data has been processed'. Click OK and the corrected images will update to reflect the new values. You can change values as much as you desire within in the program, but the CHANGES WILL ONLY TAKE EFFECT ONCE THE PROGRAM IS RUN AGAIN using the single white arrow button. If the program cannot complete (for example factitious files were used as inputs) the program should not crash, but you will not get a message. So look for the message when re-running to make sure all is well.

5) The data are displayed in linear scale by default (two color maps shown) for each type. To change to log scale and back use the green toggle and re-run. Note that the scale to the left of each image is alterable – simply chose new min and max values at will.

6) Default super mirror and flipper polarization values the helium cell parameters (gamma, Te, onl, and Po) and are chosen to match the example data set, though you can calculate your own values using the provided Excel worksheet. Do be sure you give a start date (usually the day the first helium cell is put on the beam line). Time_0, Time_1, Time_2 in hours indicate when the helium cell(s) are inserted into your experiment, relative to the experimental start day at midnight. Note you can process data using up to 3 different helium cells (1 or possibly 2 is typical) – just indicate which cell is used for

each ASCII file processed, located to the right of its drop down text box (refer to step 10 for more details).

7) If you do not want to correct for polarization leakage, but do want to correct for the helium transmission and monitor counts (all files are automatically rescaled by monitor count to 10^8) then set the super mirror polarization and flipper efficiencies to 1.

To change the default data to your own:

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8) To use your own SANS data you will first need to convert it into ASCII form. The quickest way to do this within the IGOR SANS Reduction framework is go to Misc Ops / Raw ASCII Export / Get List (select files of interest with 'detector coordinates' setting) / Export Files. If you wish to fully reduce your files into absolute sale using appropriate transmissions (recommended) set AVERAGE params to 2D_ASCII before reducing and saving the output.

9) Using the drop down menus you should easily be able to locate you files within the application as Plus-Plus files, Minus-Plus files, etc. You can currently import up to five of each type as indicated by the drop down boxes labeled # of Plus-Plus files, # Minus-plus files, etc. Select an integer between1 and 5 files – no matter what files are listed only files 1 to that number you select per configuration will be processed (and the number of files used for Plus-Plus need not match the number for Minus-Plus, etc.). Please retain at least one character, even a place holder, within each box.

10) Now you should be able to polarization-correct and view your data in real time during your experiment. If you want to process it further you can do so within IGOR using the four generated ASCII files produced (default C:\PolCorr\PPOut.ASC, etc., but fell free to change the output names as desired). To do this open IGOR and Pick Path so that you are in the same directory as your ASCII files. Then go to 2-D Ops / WorkFile Math. If you just want to view a single file change display from Result to File1 or File 2. To subtract files select the math operation of your choice, set Display to Result, and the click Do It. You can now slice and dice as usual, except that the X and Y beam center coordinates may not be updated in Sector averaging until you change the Phi value once. The parameters written to the output ASCII files using PolCorr (X, Y, detector distance, lambda, etc.) are taken directly from the ASCII files processed. Be sure that all of your input files have common configurations (as they should before any pixel-by-pixel polarization correction is attempted!).

Extras:

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11) To take care of background, with its own ^{3}He time dependence, it is best to correct these files separately. The using 2-D Ops / WorkFile Math the PP_background can be subtracted from the PP_Data, etc.

12) Enjoy and please provide feedback (kathryn.krycka@nist.gov) if there are improvements that you would like to see implemented.