This is a draft of instructions for the PMEL GUI. This document and code are still works in progress. The GUI is only used to accept the salinity correction applied by OWC and doesn't come with support. This GUI requires Matlab R2015a or higher. I have included one float that I have already DMQC'd so that you can see the directory structure that we use. I suggest testing the PMEL GUI on this float first. You will also need to download 2 more things. Currently this code is still a beta version, and has been set up to run on a windows machine.

1. WOD CTD netcdf files from NODC
    a. download all the High Resolution CTD/XCTD (CTD) netcdf files from the World Ocean Database
        i. The data is found on https://www.nodc.noaa.gov/OC5/SELECT/dbsearch/dbsearch.html
        ii. Select data sets
        iii. than select High Resolution CTD/XCTD (CTD)
        iv. than select Netcdf files as single casts
        v. place the files in `path_wod_files` (defined in edit_netcdf3_PMEL.m)
        vi. update the name of the index files locations in edit_netcdf3_PMEL.m (`wod_index_file1`,`wod_index_file2`) that come from WOD

2. ARGO database from argo (I have included a copy of the index of my Argo database)
    a. mirror all structure from the GDAC of ../argo/dac/ to `path_argo_files` (defined in edit_netcdf3_PMEL.m).
    b. copy ar_index_global_prof.txt from ../argo into `path_argo_files` (defined in edit_netcdf3_PMEL.m).
    c. run make_argo_index_file_from_txt.m to produce matlab version of the file that runs faster. You will need to update the paths within make_argo_index_file_from_txt.m.
    d. run new_ar_index.m to make a version of the index file that only contains D-mode files. You will need to update the paths in new_ar_index.m. make sure that the output file is put in `path_argo_files` used in the edit_netcdf3_PMEL.m
    e. I have included a old version of `ar_index_global_prof_fast_OSX_D.mat.` With the code. You can use this file instead of making a new version `ar_index_global_prof_fast_OSX_D.mat`

3. Update paths in edit_netcdf3_PMEL.m (you might not need to change main_path. This gui assumes PMEL file structure):

```
path_argo_files='C:\argo\mirror\';
argo_index_file='C:\argo\mirror\ar_index_global_prof_fast_OSX_D.mat';
path_wod_files ='C:\argo\wod_all_ctd\';
wod_index_file1 ='C:\argo\wod_all_ctd\ocldb1463707684.27905.CTD.nc';
main_path=['C:\gui_share\data\'];
```

4. owc needs to write a mat file into ../data/WMOnumber/plots/ that contains the salinity correction data. I have added:

```
file_name_save=strcat(po_system_configuration.FLOAT_PLOTS_DIRECTORY,pn_f
loat_dir,po_system_configuration.FLOAT_PLOTS_SUBDIR,'ow_plot_info.mat');


% JML 5-5-2016 save data
ave_hist_sal=avg_Staoffset;
ave_fit=avg_Soffset;
ave_fit_error=avg_Soffset_err;
ave_prof_no=PROFILE_NO;
eval(['save ',file_name_save,' ave_hist_sal ave_fit ave_fit_error
ave_prof_no'])
```

to plot_diagnostics_ow .m. I included my copy of plot_diagnostics_ow .m that might work depending on how you set up OW.

5) Add m-scripts to your path

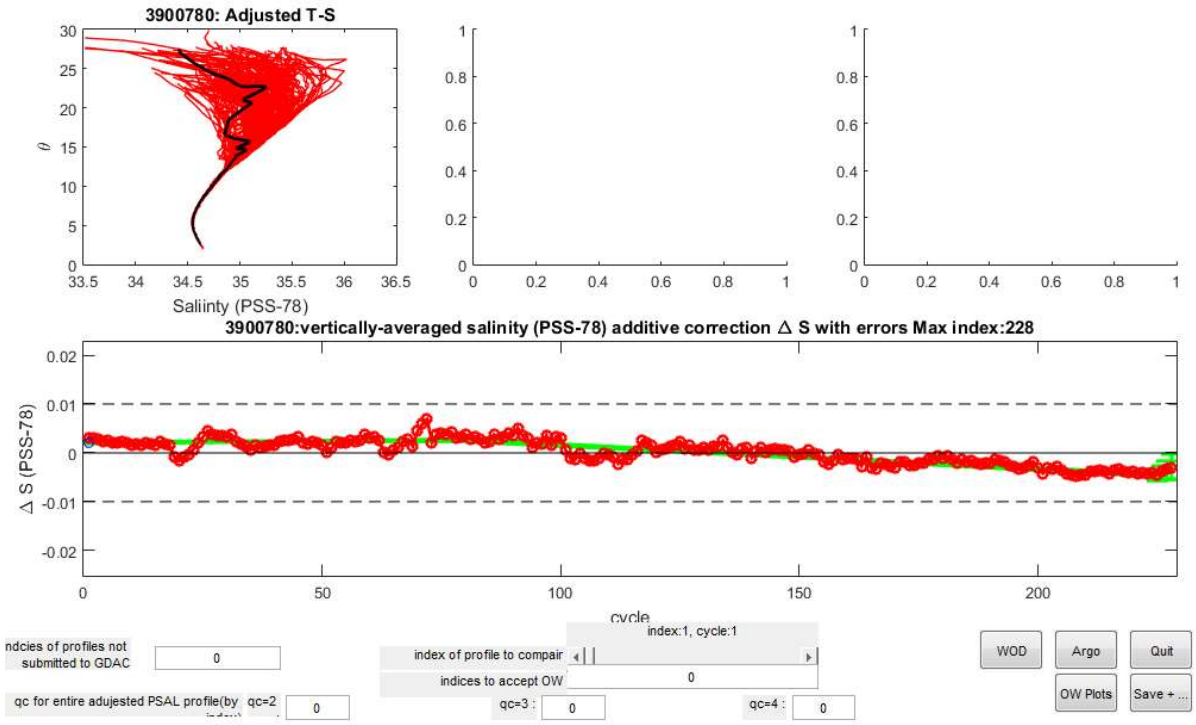
Once setup. Type:

>> edit_netcdf3_PMEL

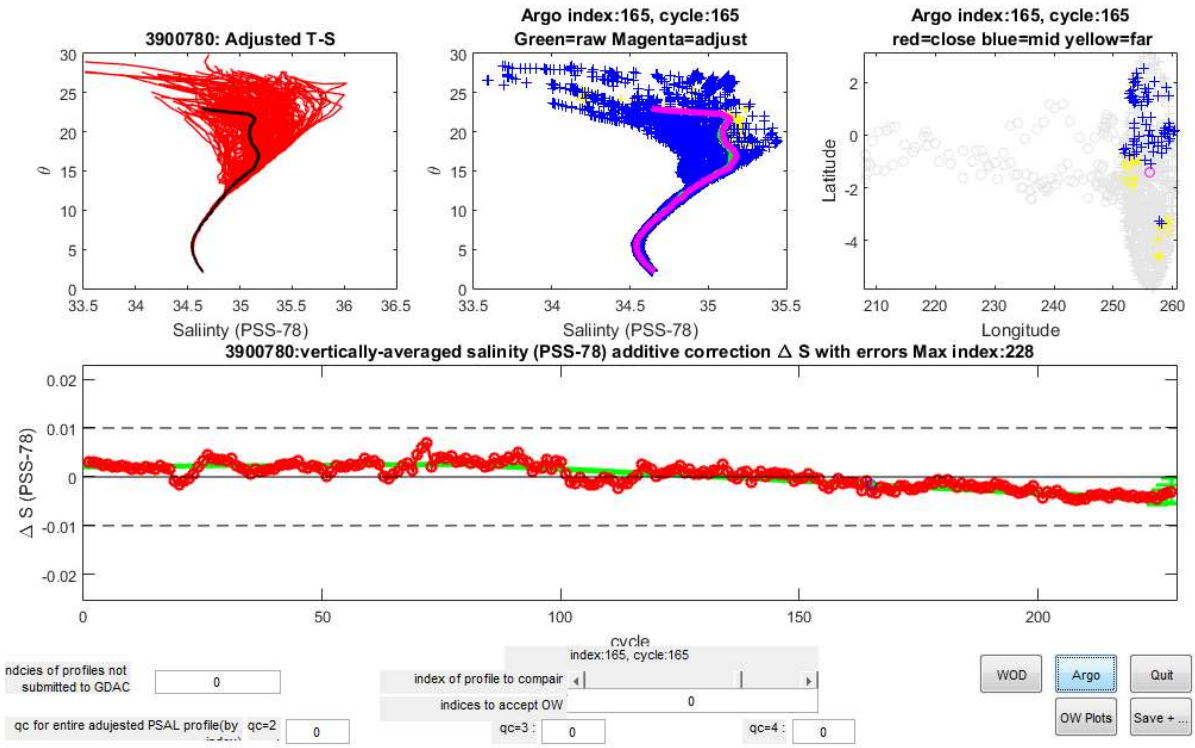
Then input a wmo number of the float (use 3900780! Because it is the only float that I sent.)

What is the WMO # of the float you wish to edit? >> 3900780

A window should open that looks like:



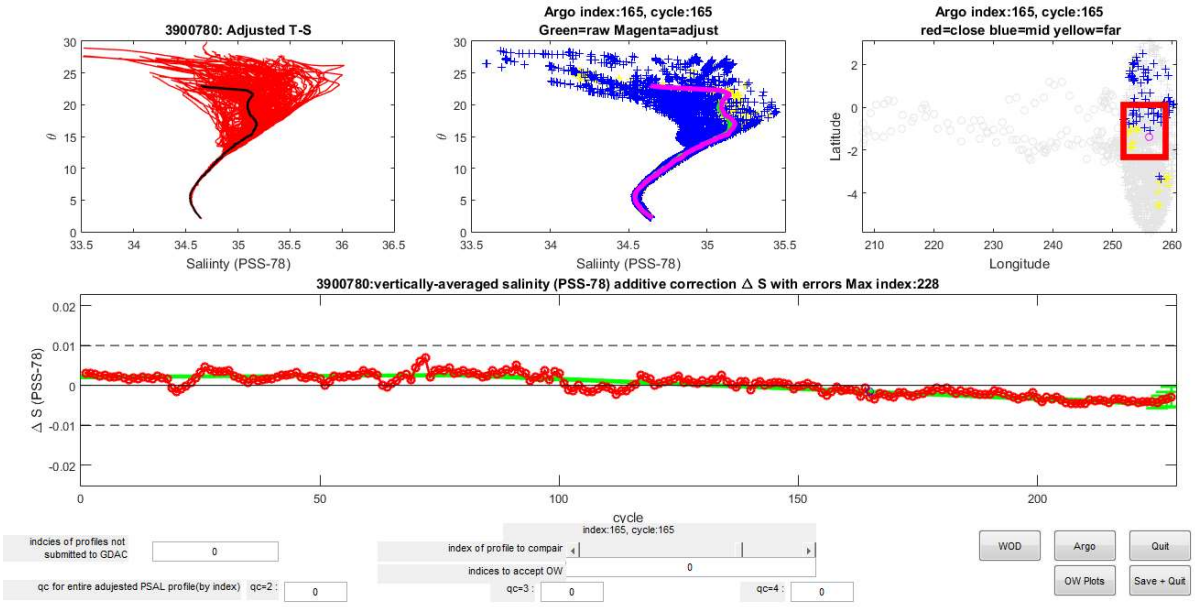
All the panels are interactive. The long panel on the bottom is for OW and shows the size of the correction. From this panel you can choose which float you want to look at, either by selecting a profile directly from the panel or from “index of profile to compare” slider bar. Once selected you can push either the “WOD” button or “Argo” to compare the OW correction with either database. In the following case I choose the “Argo” button:



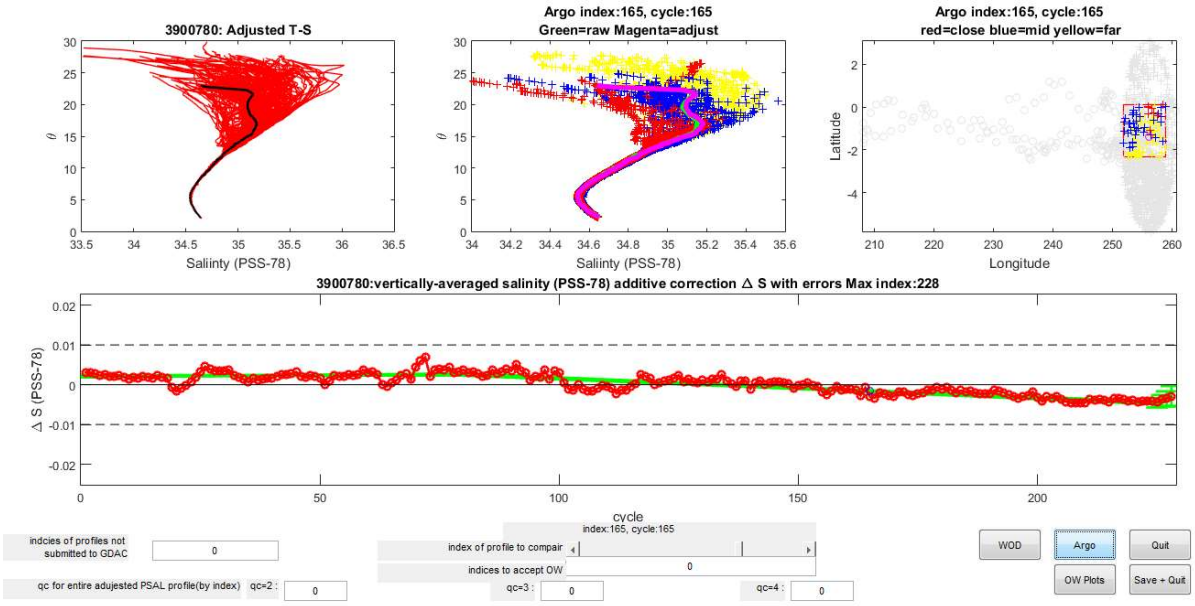
This downloads the 100 closest Argo profiles. "Closest" is determined by space and time assuming 60days = 100km. The magenta circle (top right panel) represent the currently selected profile and corresponds to the magenta line (top middle panel) and the black line (top left panel). The blue, yellow and red + symbols (top right panel) are the Argo profile locations from the reference database. Yellow are the 25% that are the furthest away, blue are the 50% mid distance, and red are the closest 25%. The blue, yellow and red + symbols (top middle panel) correspond to the profile locations in the top right panel. The grey circles and (top right panel) are the current float trajectory. The grey + symbols (top right panel) represent the reference Argo profiles that are not shown in the top middle panel.

If you select a Argo reference profile in the top middle panel a thin black line will be drawn through the profile and a black circle will appear at the profile location on the top right panel. Likewise, if a Argo reference profile location is selected in the top right panel, a black circle will be drawn on the top right panel and a thin black line will be drawn through the Argo reference profile in the top middle panel.

If you want to look at a particular subset of the Argo reference database you can select the floats that you are interested in the top right panel using the mouse (make sure no tools are selected in the plot window):

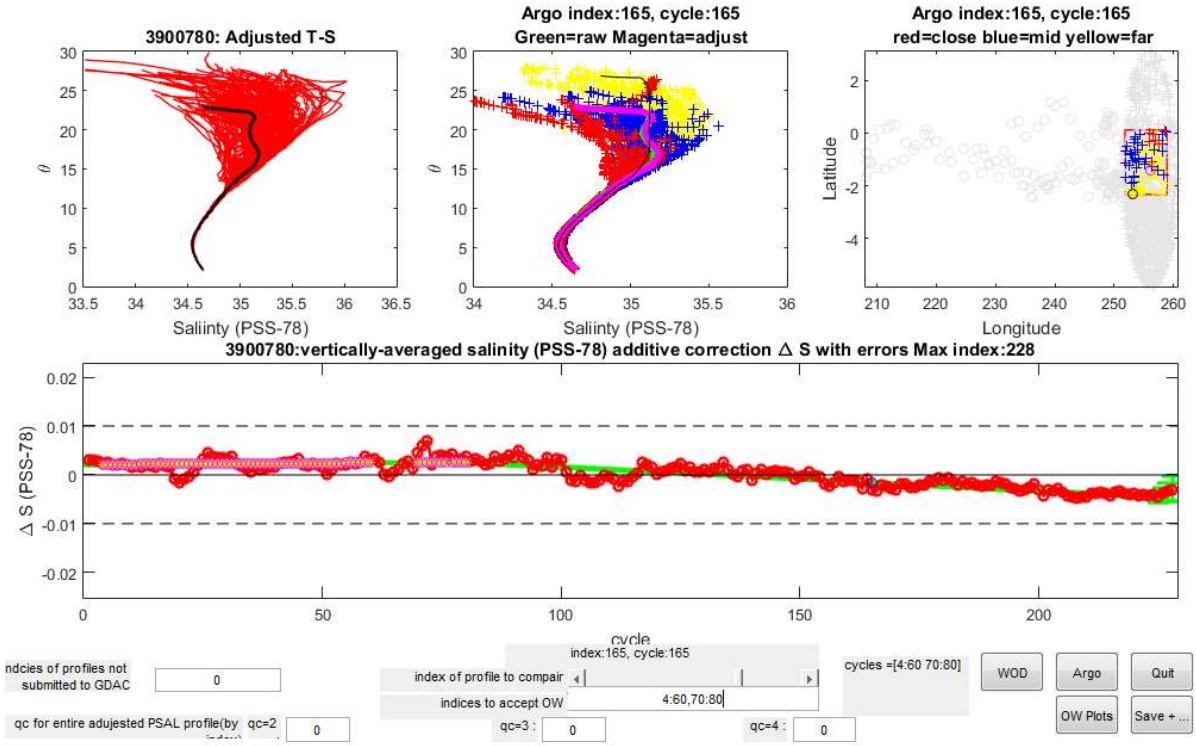


Push the Argo button again and the box (top right panel) becomes thin and the 100 closest Argo reference profiles are shown (the top middle panel).

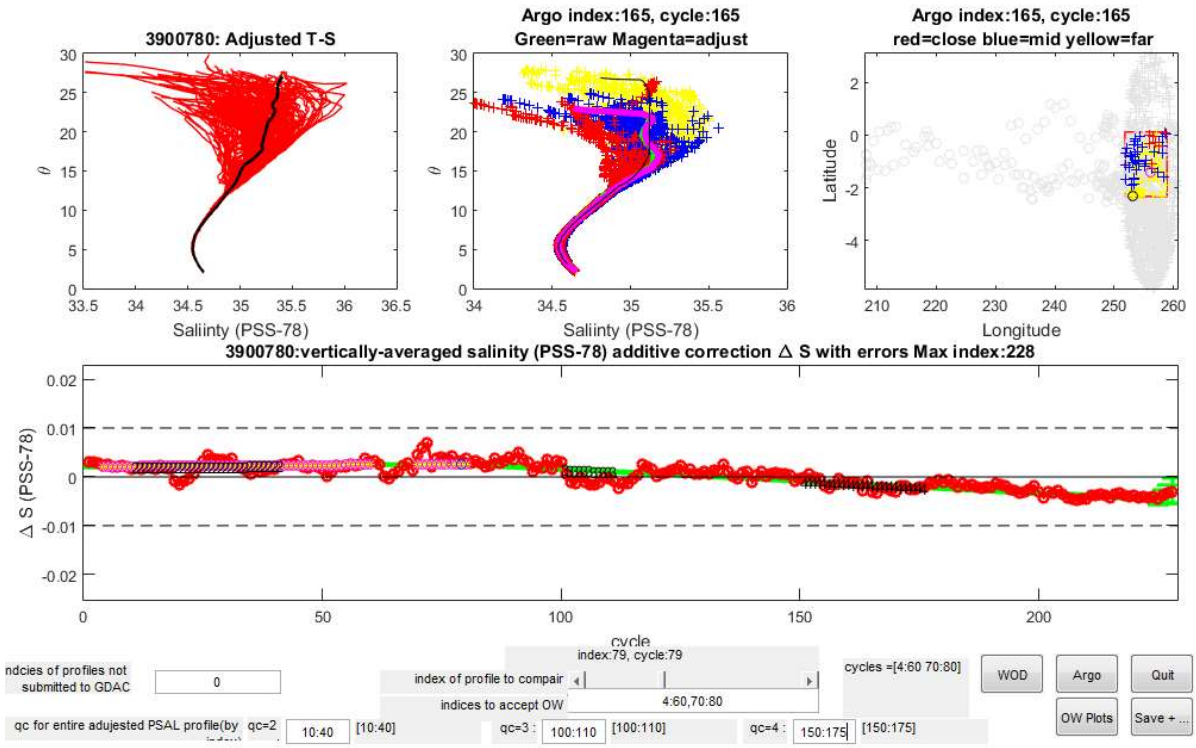


The WOD button works the same, however the time distance scales are different and the colours are set at fixed distances. For the case of the WOD 5 years = 500 km. In km space: 0-500 (red),500-1000 (blue) ,>1000(yellow).

Selecting the profiles you want to accept the correction for is done by index number and not cycle number. Simply type, in matlab notation, an array of the Argo indices that you want to accept the correction for in the box to the right of “indices to accept OW” and hit return. The result is echoed in cycle notation next to the right and stars are marked on the accepted profiles (large bottom panel).



The qc flags for salinity on the entire profile can also be changed in the same manor by inputting an array of the Argo indices in the appropriate box. This is echoed in cycles to the right and profiles are marked on the salinity correction plot with the qc flag number (large bottom panel).



If you want to view the OW plots for this plot push "OW Plots" button (only works in windows).

At the end hit the "Save + Quit" button. This does a lot of file formatting that might not be necessary at our lab and takes a long time.

If you hit the "Quit" button the gui quits and nothing is saved.

When cycles are missing, cycles and indices will not be the same.

This is the first time that I have sent the gui to anyone! I have gone through and tried to get read of dead links, unnecessary comments and useless fragments of test code, but I probably have left more than I wanted to and deleted things I should have kept. Please let me know if you have any problems.