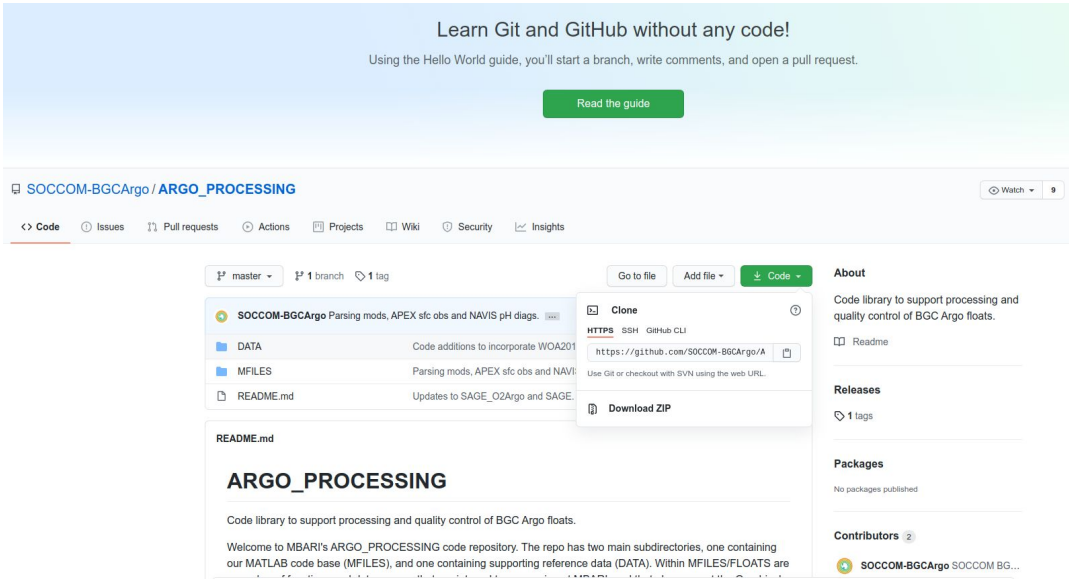
SAGE O_2-Argo: SOCCOM Assessment and Graphical Evaluation for Oxygen

How to do DM QC with SAGE O_2?

Contact: raphaelle.sauzede@imev-mer.fr

Where to find SAGE O_2 GUI?



Clone the GUI repository “ARGO_PROCESSING” from github here: https://github.com/SOCCOM-BGCArgo/ARGO_PROCESSING and place it somewhere on your local machine (for example /home/username/Documents/MATLAB/, where username is the username of the machine)

SAGE O_2: Why?

➜ visualize float oxygen data from Argo NetCDF files in comparison to **WOA climatology** and **NCEP reanalysis** products (used to estimate atmospheric oxygen partial pressure along a float track) in order to derive float specific gain correction values

Where to find the user manual of SAGE O_2:

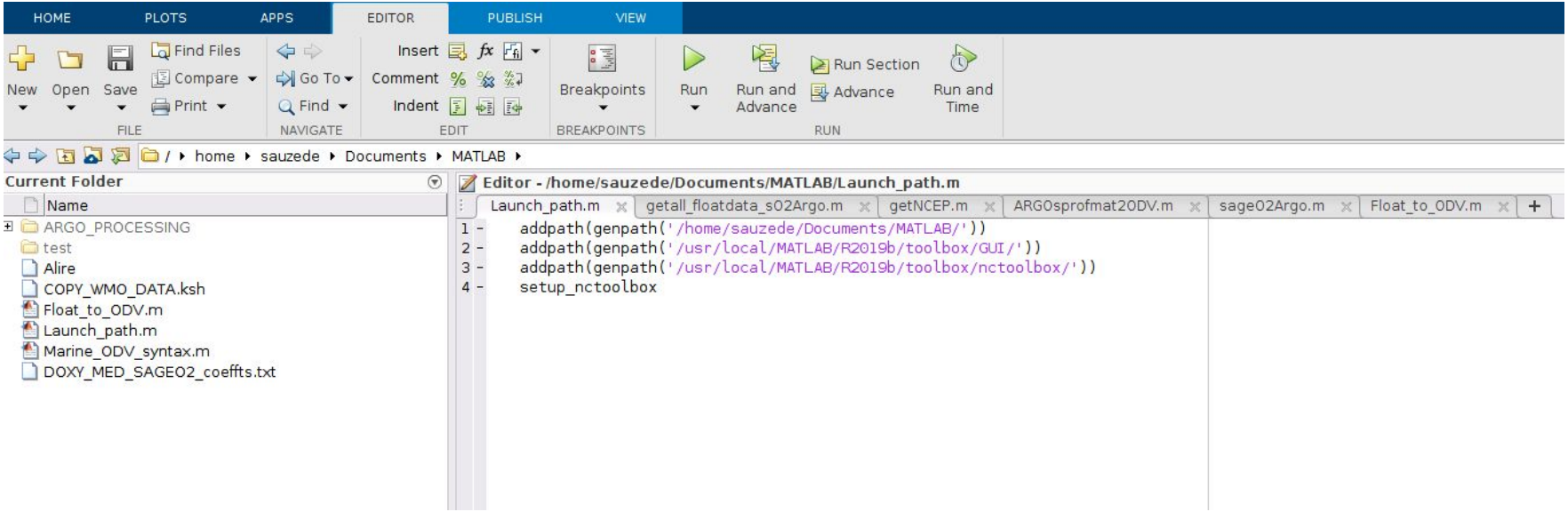
https://usermanual.wiki/Document/SageO2ArgoManual.1001023672/view

1- Toolbox required for installing SAGE O_2

- MATLAB must be properly installed and licensed on your machine before proceeding
- 2 freely-available external MATLAB toolboxes that must be downloaded prior to GUI use :

Toolbox	Download	Notes
GUI Layout Toolbox	https://www.mathworks.com/matlabcentral/fileexchange/47982-gui-layout-toolbox	Note the two separate download options for MATLAB versions before and after R2014b.
Nctoolbox-1.1.3	https://github.com/nctoolbox/nctoolbox	Be sure to permanently add the toolbox setup to your startup.m file. See notes under “setup” at the download link location.

2- Create a file: launch_path.m



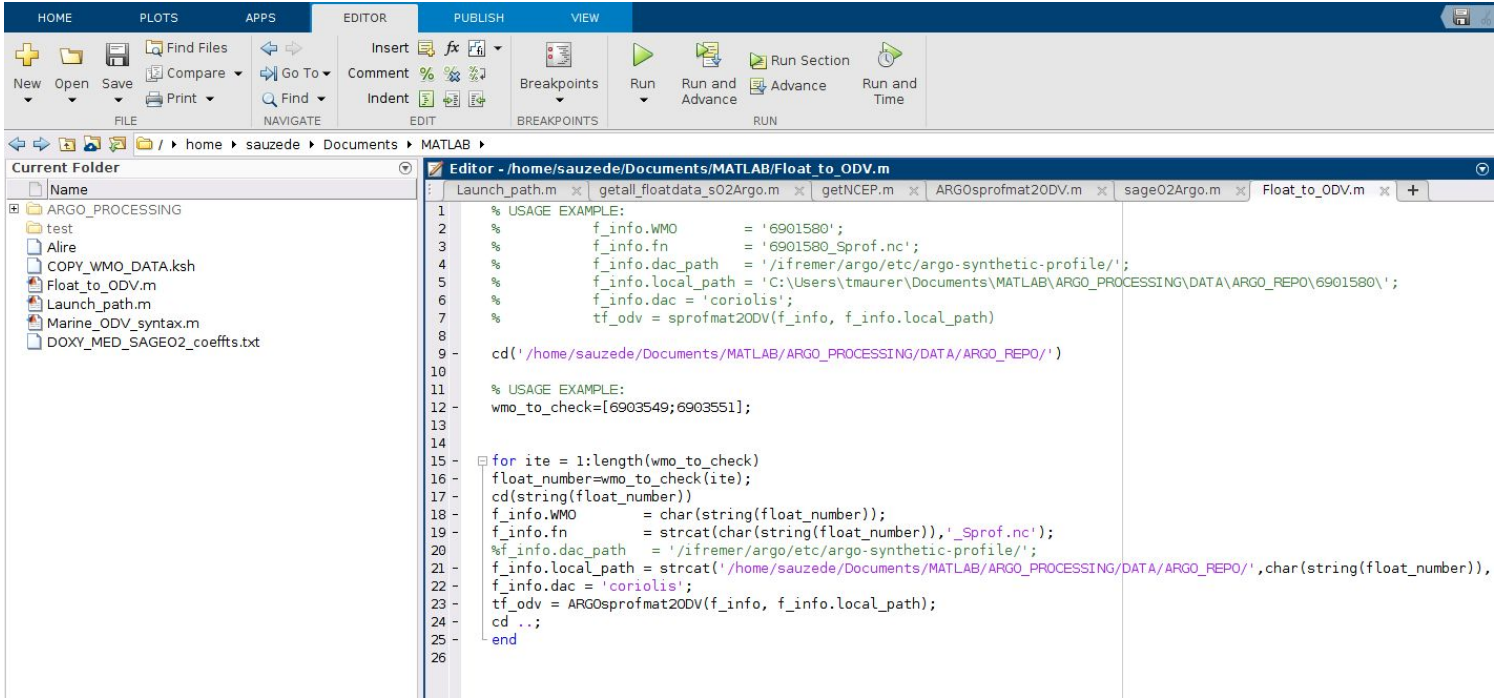
➔ and run it

3- Add Argo data to Argo repository

```
(base) sauzede@sauzede-Latitude-5490:~$ cd Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO/
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$ ls
3902120      6901466  6901774  6902740     6902900  6902962  6903247
3902121      6901467  6901775  6902740_JP  6902901  6903024  6903249
3902122      6901470  6901897  6902803     6902903  6903025  6903262
3902123      6901471  6901898  6902804     6902904  6903026  6903266
3902124      6901476  6902687  6902828     6902905  6903153  6903549
3902125      6901487  6902701  6902870     6902906  6903180  6903550
4901805      6901573  6902733  6902871     6902907  6903204  6903551
6901460      6901577  6902734  6902872     6902908  6903222  ARGO_REPO_help.txt
6901462      6901596  6902735  6902873     6902909  6903225  test
6901463      6901657  6902736  6902874     6902935  6903237
6901464      6901770  6902737  6902875     6902936  6903238
6901464_ori  6901771  6902738  6902876     6902937  6903240
6901465      6901772  6902739  6902880     6902954  6903246
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$ mkdir 6902954
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$ cp /home/sauzede/ARGO_DATA/coriolis/6902954/*.nc 6902954/
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$ ls 6902954
6902954_BRtraj.nc  6902954_prof.nc   6902954_Sprof.nc  ODV6902954.TXT
6902954_meta.nc    6902954_Rtraj.nc  6902954_tech.nc
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$
```

→ Need the Argo formatted *.BRtraj.nc, *meta.nc, and *Sprof.nc

4- Create ODV file: Float_to_ODV.m



➜ and run it to create ODV file for each float you want to process with SAGE O_2

NB: if you are on Linux

In ARGOSprofmat2ODM.m (in /ARGO_PROCESSING/MFILES/GUIS/SAGE_O2Argo/SProf_Conversion/):

Line 58: change HOMEDIR with PATH

4- Create ODV file: Float_to_ODV.m

```
(base) sauzede@sauzede-Latitude-5490:~$ cd Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO/
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$ ls
3902120      6901466  6901774  6902740     6902900  6902969  6903247
3902121      6901467  6901775  6902740_JP  6902901  6903024  6903249
3902122      6901470  6901897  6902803     6902903  6903025  6903262
3902123      6901471  6901898  6902804     6902904  6903026  6903266
3902124      6901476  6902687  6902828     6902905  6903153  6903549
3902125      6901487  6902701  6902870     6902906  6903180  6903550
4901805      6901573  6902733  6902871     6902907  6903204  6903551
6901460      6901577  6902734  6902872     6902908  6903222  ARGO_REPO_help.txt
6901462      6901596  6902735  6902873     6902909  6903225  test
6901463      6901657  6902736  6902874     6902935  6903237
6901464      6901770  6902737  6902875     6902936  6903238
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6901465      6901772  6902739  6902880     6902954  6903246
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$ mkdir 6902954
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$ cp /home/sauzede/ARGO_DATA/coriolis/6902954/*.nc 6902954/
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$ ls 6902954
6902954_BRtraj.nc  6902954_prof.nc   6902954_Sprof.nc  ODV6902954.TXT
6902954_meta.nc    6902954_Rtraj.nc  6902954_tech.nc
(base) sauzede@sauzede-Latitude-5490:~/Documents/MATLAB/ARGO_PROCESSING/DATA/ARGO_REPO$
```
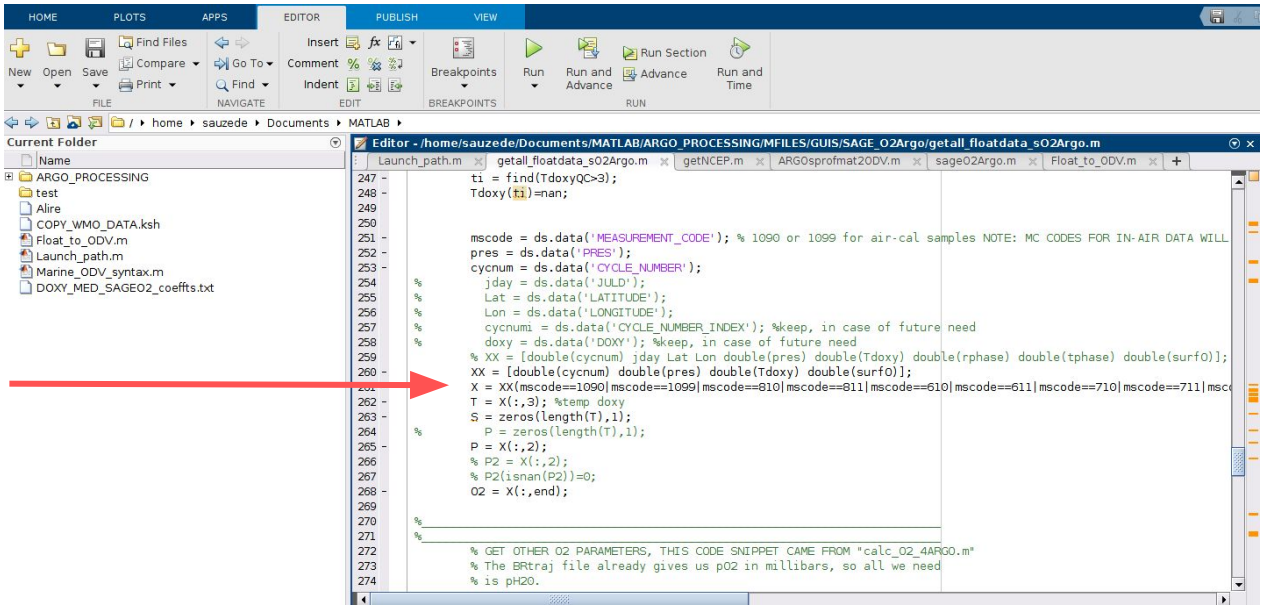
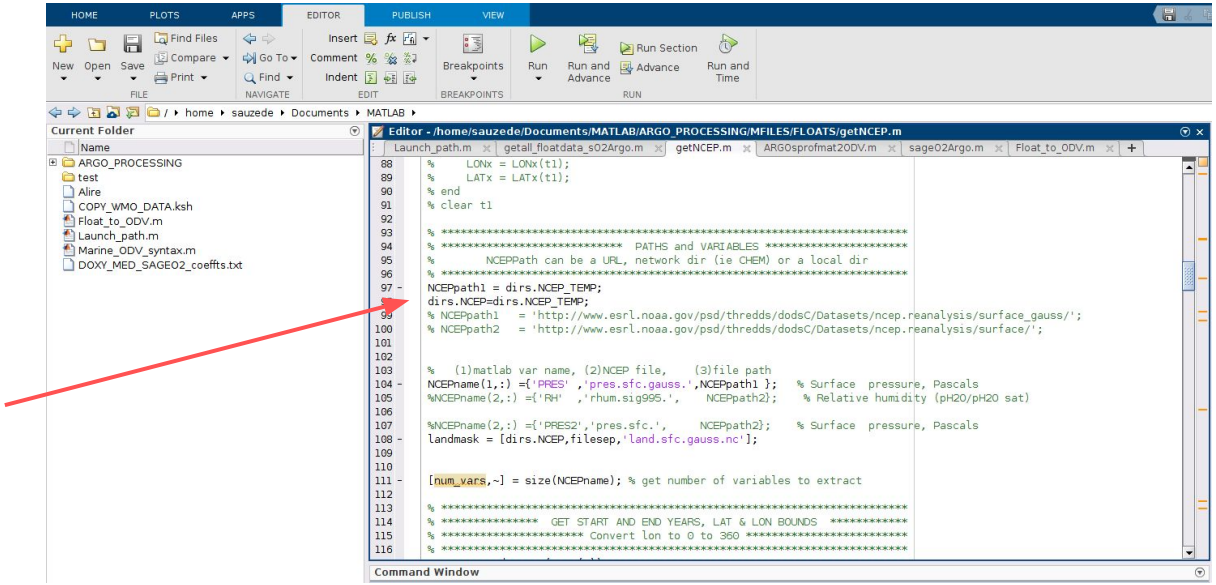

5- Modifications for measurement codes to find in air data

In getall_floatdata_sO2Argo.m (in /ARGO_PROCESSING/MFILES/GUIS/SAGE_O2Argo/):

Line 261: add mscodes 110/ 111/ 610/ 611/ 710/ 711/ 810/ 811



5- NCEP data (in air climatology)

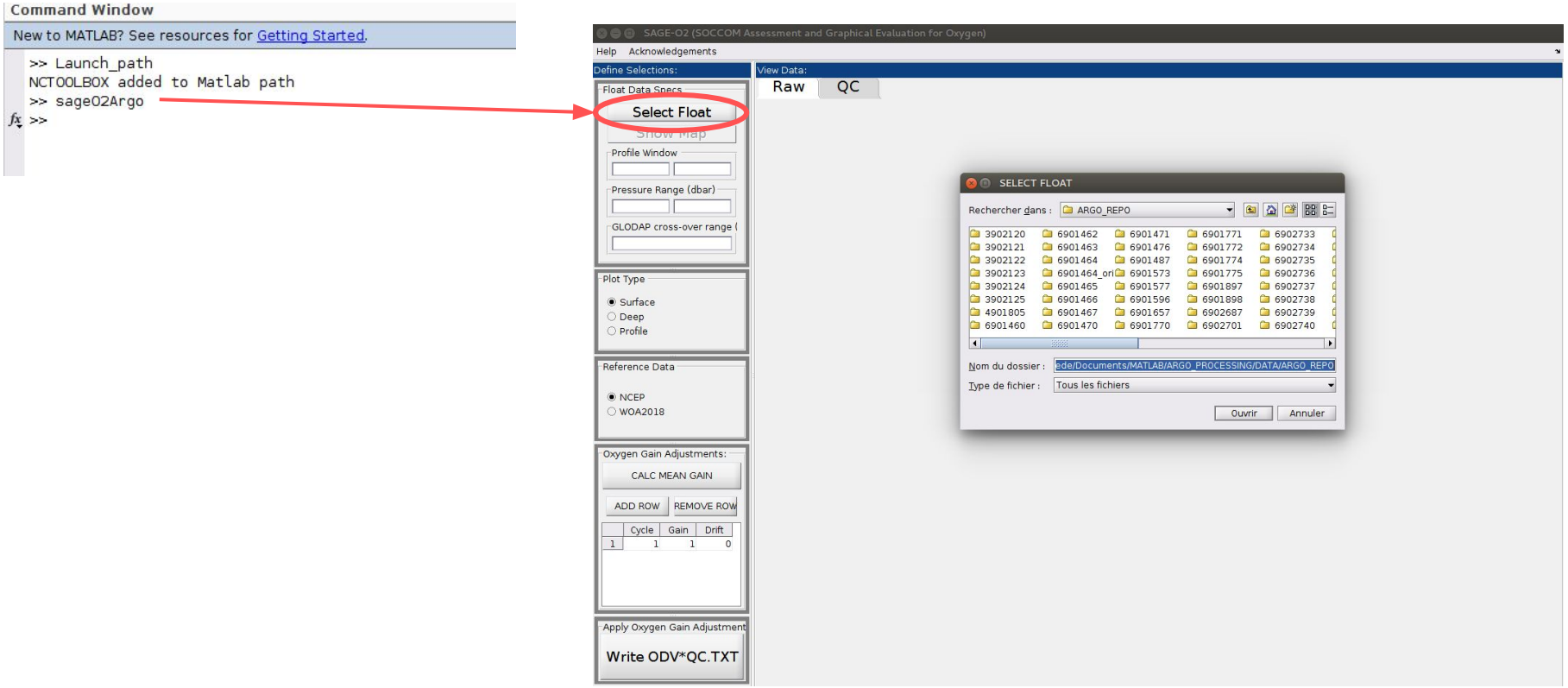


For info: getNCEP.m in /ARGO_PROCESSING/MFILES/FLOATS/ lines 97-100: I decommented NCEPpath1 = dirs.NCEP_TEMP; and I added dirs.NCEP = dirs.NCEP_temp

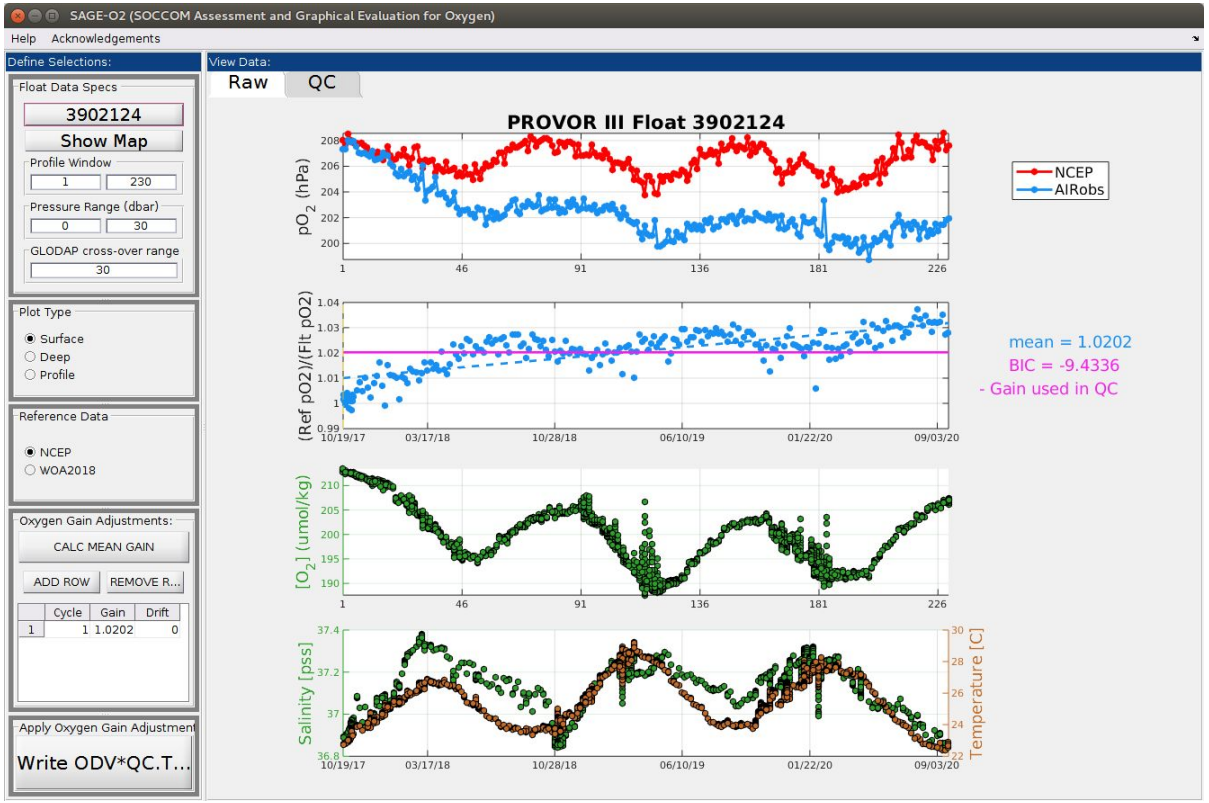
To download NCEP data: ftp://ftp.cdc.noaa.gov/Datasets/ncep.reanalysis/surface_gauss/

➜ download pres.sfc.gauss.2020.nc for year 2020 in NCEP_TEMPORARY folder

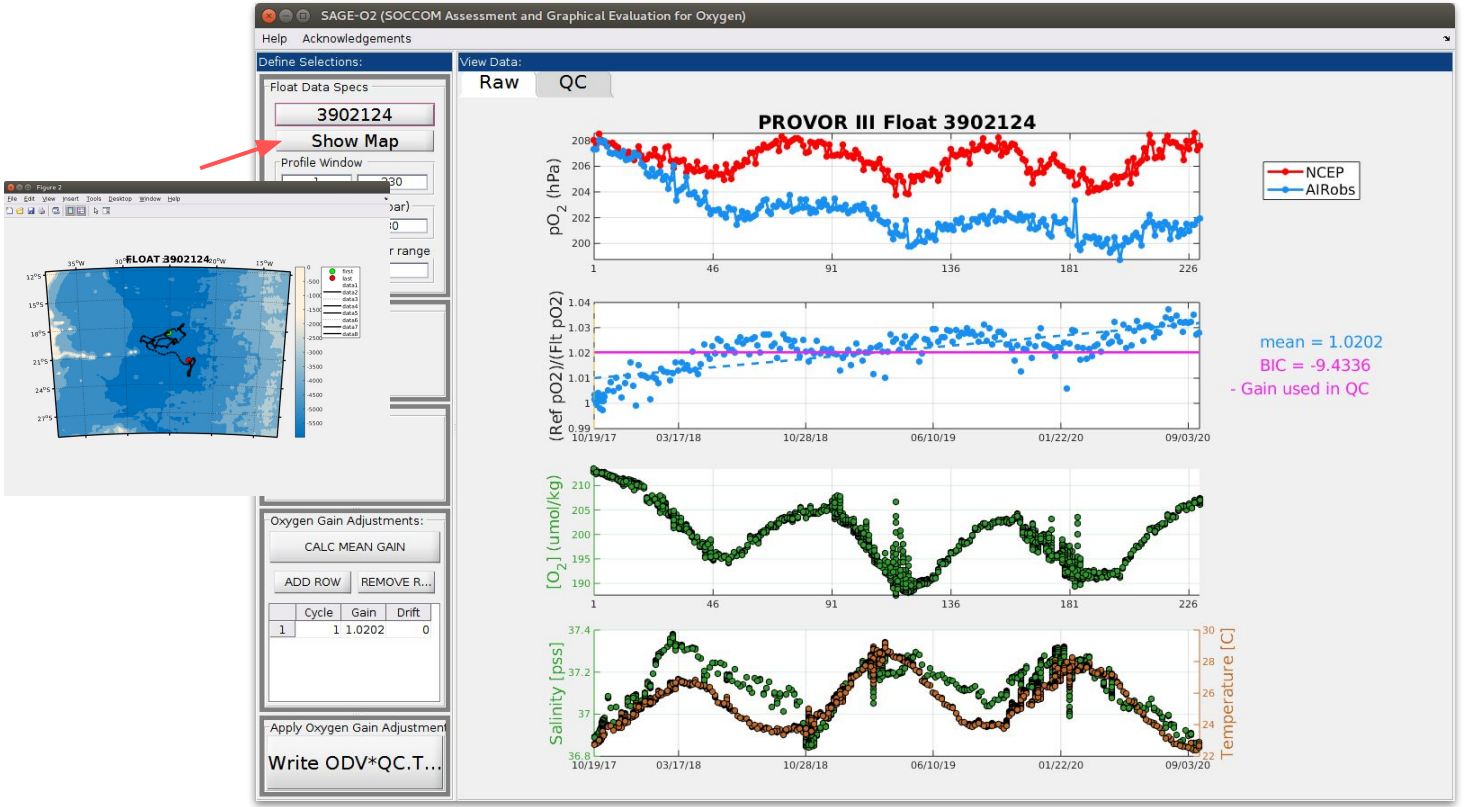
5- Launch SAGE O_2 in MATLAB



6- SAGE O_2 GUI


SAGE-O2 (SOCCOM Assessment and Graphical Evaluation for Oxygen)
Help
Acknowledgements
Define Selections:
Float Data Specs
3902124
Show Map
Profile Window
1
230
Pressure Range (dbar)
0
30
GLODAP cross-over range
30
Plot Type
Surface
Deep
Profile
Reference Data
NCEP
WOA2018
Oxygen Gain Adjustments:
CALC MEAN GAIN
ADD ROW
REMOVE R...
Cycle
Gain
Drift
1
1 1.0202
0
Apply Oxygen Gain Adjustment
Write ODV*QC.T...
View Data:
Raw
QC
PROVOR III Float 3902124
pO2 (hPa)
NCEP
AIRobs
(Ref pO2)/(Flt pO2)
mean = 1.0202
BIC = -9.4336
- Gain used in QC
[O2] (umol/kg)
Salinity [pss]
Temperature [C]
10/19/17
03/17/18
10/28/18
06/10/19
01/22/20
09/03/20

6- SAGE O_2 GUI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3902124
Show Map
Profile Window
Oxygen Gain Adjustments:
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ADD ROW
REMOVE R...
Cycle
Gain
Drift
1 1 1.0202 0
Apply Oxygen Gain Adjustment
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PROVOR III Float 3902124
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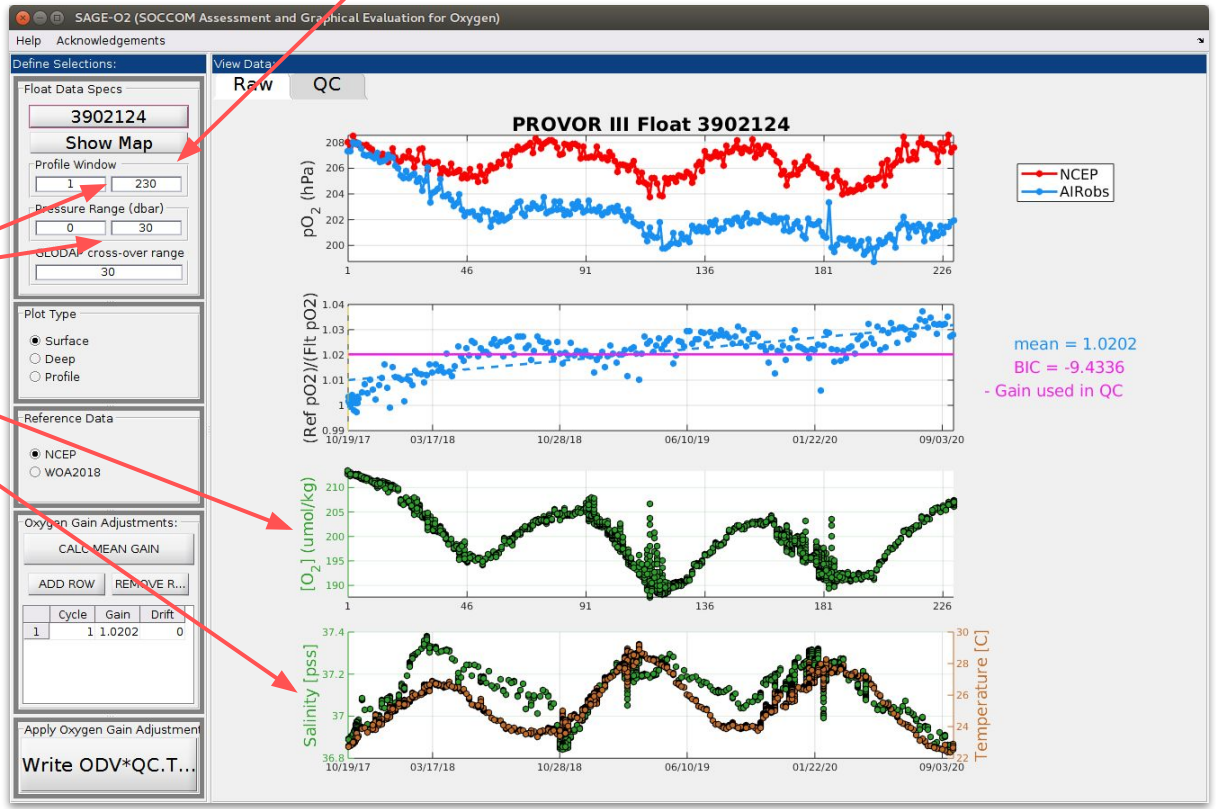
[O2] (umol/kg)
Salinity [pss]
Temperature [C]
10/19/17
03/17/18
10/28/18
06/10/19
01/22/20
09/03/20
FLOAT 3902124

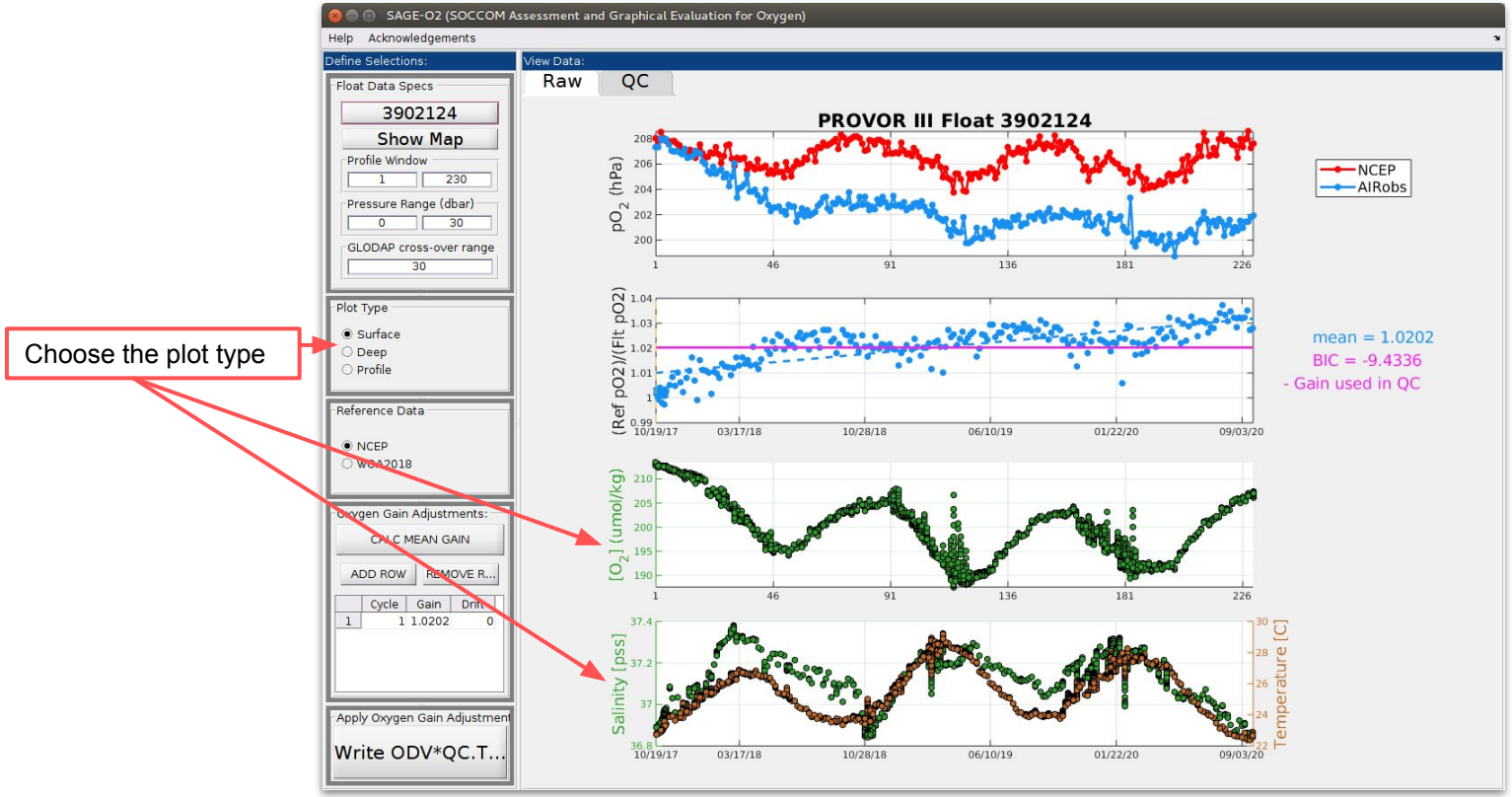
6- SAGE O_2 GUI

Number of cycle

Change the pressure and cycle range



6- SAGE O_2 GUI


Choose the plot type
SAGE-O2 (SOCCOM Assessment and Graphical Evaluation for Oxygen)
Help
Acknowledgements
Define Selections:
Float Data Specs
3902124
Show Map
Profile Window
1
230
Pressure Range (dbar)
0
30
GLODAP cross-over range
30
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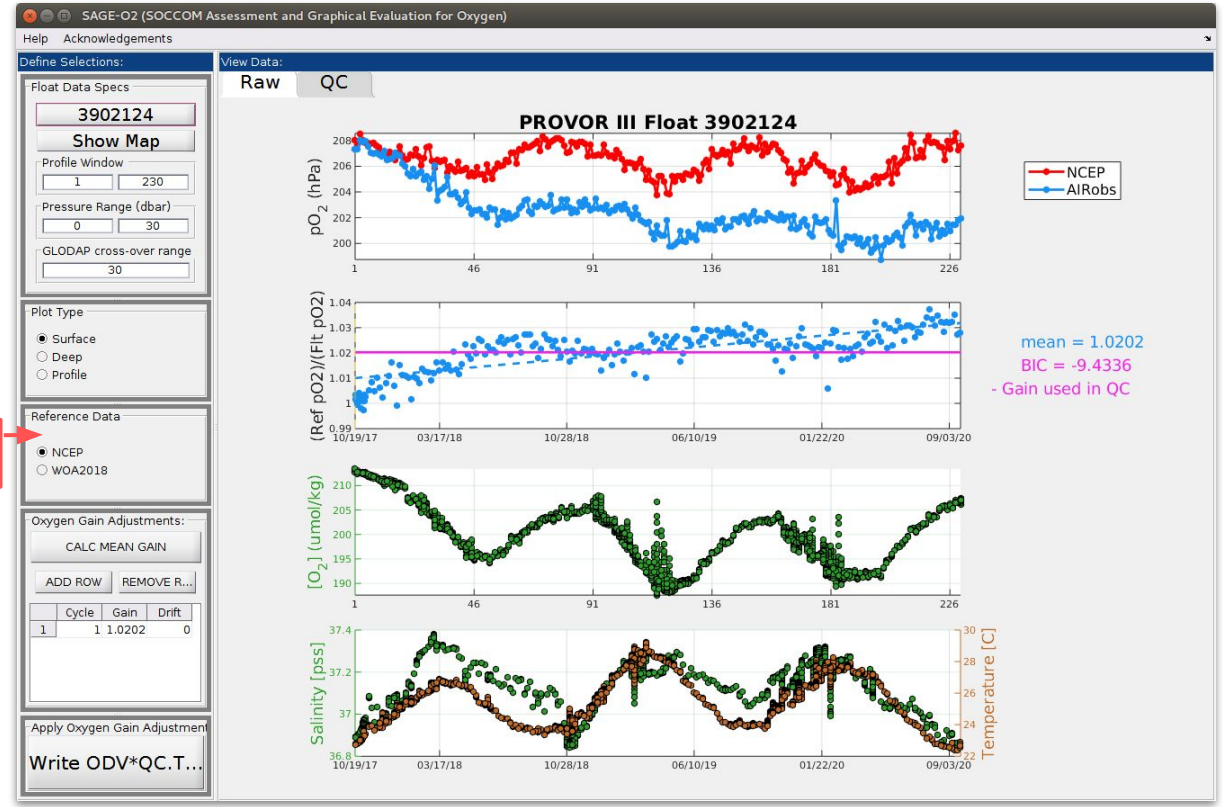
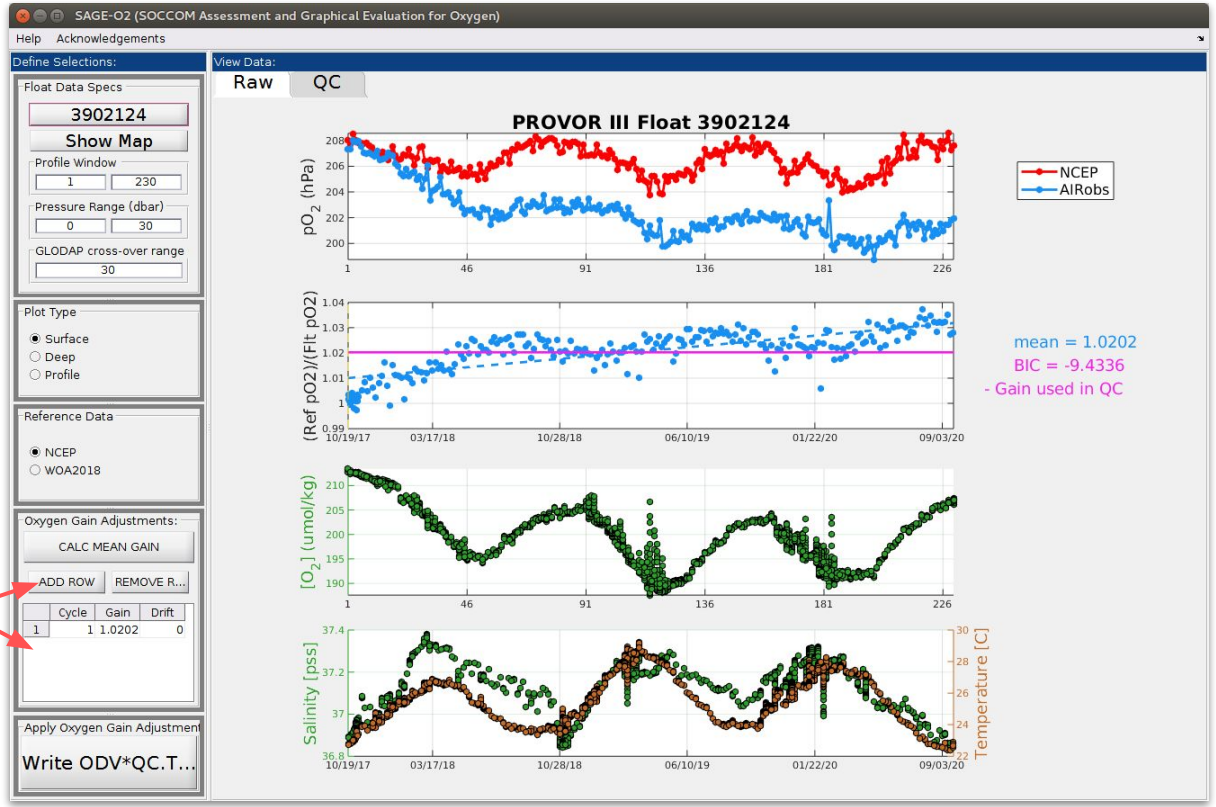
Salinity [pss]
Temperature [C]
10/19/17
03/17/18
10/28/18
06/10/19
01/22/20
09/03/20

6- SAGE O_2 GUI

If NCEP available → choose between NCEP and WOA

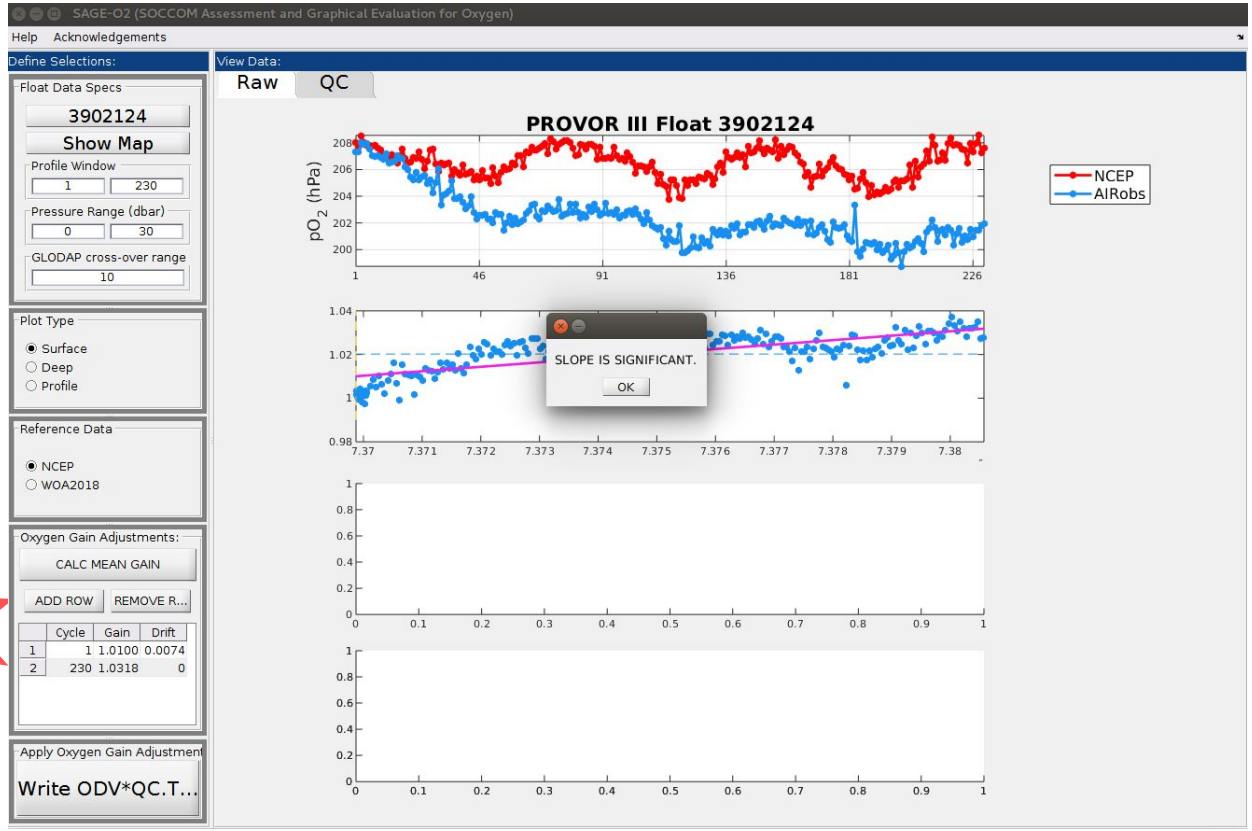


6- SAGE O_2 GUI



Add row and put the chosen cycle (last cycle for calculating drift and add several rows for adding breakpoints)

6- SAGE O_2 GUI



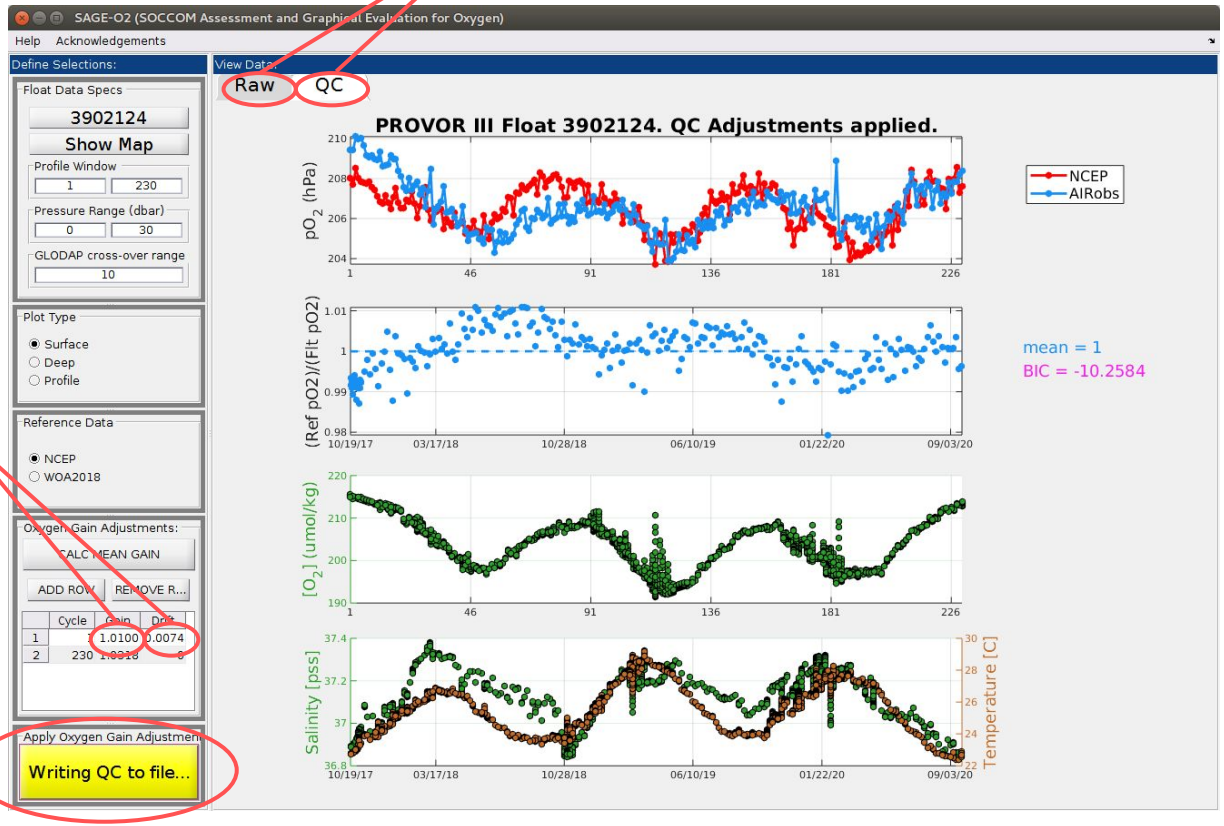
Add row and put the chosen cycle (last cycle for calculating drift and add several rows for adding breakpoints)

6- SAGE O_2 GUI

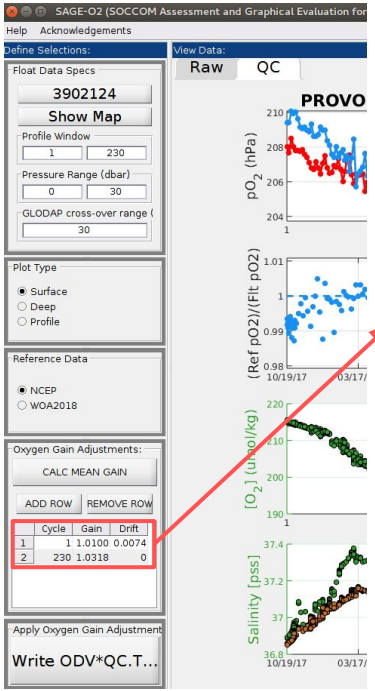
Choose to plot Raw or QC data

The gain and drift are given here

When you are happy write the results



7- Coefficients for oxygen adjustments



Cycle	Gain	Drift
1	Gain to apply from cycle 1 to 10	Drift to apply from cycle 1 to 10
10	Gain to apply from cycle 10 to 20	Drift to apply from cycle 10 to 20
20	Gain to apply from cycle 20 to ...	Drift to apply from cycle 20 to ...
...	...	...
70	xxx	0

These last values are not used to compute the oxygen gain adjustments