**Python/Interpolation/Interpolation\_1D.py**

# The following is the Optimal Interpolation program.

# It needs:

# The array of x values (xi)

# The array of y values (Obsv)

# The observation error (Obs\_err), which should be 1/10 of y value to keep the program running well

# The background error (Bkg\_err), it determines how stif the curve is. (For bending)

# The background error (Bkg\_err), related to the scale of x. For TABS observation data, when x is 10^9 seconds, Bkg\_err is 100000.

# The background error (Bkg\_err) could be related to y values.

# The background error Bkg\_err is about the bending (Ro), when the scale of x-axsis changed, it need to change.

# Max\_Bkg\_err\_va(Max\_Bkg\_err\_va) is the maximum background error variance, it need to be less than 1/10 of the background error.

# For TABS observation data, Max\_Bkg\_err\_va(Max\_Bkg\_err\_va) = 500 works quite well.

# It returns x array (x); Analysis array (Analysis); and analysis errow (Ea).

**/Python/Interpolation/model\_value.py**

# The purpose of this module is to get the prediction data for each buoy from specific NetCDF file.

# A specific time period may be planned.

# The inputs: NetCDF file name and path, buoy name (location is in the module)

# The outputs: an array of prediction data specific for a buoy

# an array of time series for the prediction

**/Python/Interpolation/fit-correct.py**

This program access MySQL database for TABS current data, and use optimal interpolation to filter the noise.

Then it find the bias, and make the correction.

The skill value before and after correction are calculated.

This program was further improved to correct-extesion.py, in which more previous NetCDF files can be included for the correction.

**/Python/Interpolation/correct-extesion.py**

This program access MySQL database for TABS current data, and use optimal interpolation to filter the noise.

Then it find the bias, and make the correction.

The skill value before and after correction are calculated.

This program was further improved from fit-correct, and now previous NetCDF files can be included for the correction.