# Exercises: CTD data

The purpose of these exercises is that you, before the field steps of the course, should get acquainted with data collected with CTD. During the exercises you will use Jupyter Notebook and the Python programming language to load and visualize data. The dataset you are going to work with consists of CTD data collected along a transect just west of Gibraltar (see map).
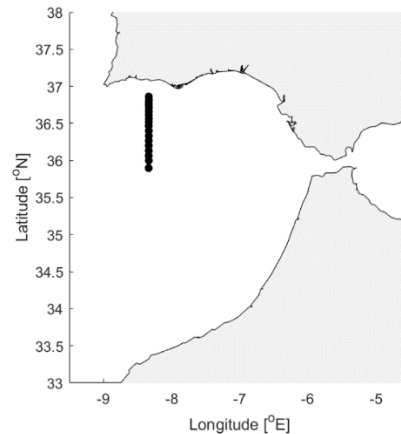
In this area there are masses of water that can be clearly distinguished based on their characteristic temperature and salinity. An example of such a body of water is so-called Mediterranean Outflow Water originating in the Mediterranean. This water characterized by high salinity and relatively high temperature.

In the following link you can access the Jupyter notebook where the exercise is described. Using binder (online server to run python), open the Jupyter notebook and work on it!

https://github.com/EstelFont/MAV104_CTD_H21.git

The data files are available on the previous link and on Canvas under **Files –> Exercise_CTD -> Exercise data.** Download all the data that is there and save them on your computer. Using Jupyter Hub. you must upload all files to the server to work with them in Jupyter Notebook. You do this by clicking on the button with an upward arrow (Upload Files) above the file manager in the left toolbar. Put the 18 text files in a separate folder, ie not together with the Excel file.

The file names indicate the positions (latitude and longitude) of the CTD casts. The Excel document contains data from all 18 throws, compiled so that each sheet in the document contains all data for a parameter. Each column contains data from a roll. The first line on each sheet indicates station number while the two following lines indicate latitude respectively longitude of the cast. The first column indicates the depth of the data points on each row.

By the end of the practice you have to submit a .pdf on canvas with:
- Your name
- 7 figures:
    o Exercise 1
        ▪ Temperature depth profile for several CTD casts
        ▪ Salinity depth profile for several CTD casts
        ▪ Oxygen depth profile for several CTD casts
    o Exercise 2
        ▪ Temperature section (x axis latitude, y axis depth, colored by temperature)
        ▪ Salinity section (x axis latitude, y axis depth, colored by salinity)
        ▪ Oxygen section (x axis latitude, y axis depth, colored by oxygen)
        ▪
    o Exercise 3
        ▪ T-S diagram colored by depth

Lycka till!