1. READ ME

Variables are written for each individual profile in a text file, as follows:

Column 1: pressure, p

Column 2: diapycnal turbulent diffusivity, Kz (shifting average, 5m)

Column 3: dissipation rate, ϵ, (shifting average, 5m)

Column 4: dissipation rate (2 sensors average)

Column 5: dissipation rate, sensor 1

Column 6: dissipation rate, sensor 2

Column 7: temperature (shifting average, 5m)

Column 8: salinity (shifting average, 5m)

Column 9: buoyancy frequency square, N^2 (shifting average, 5m)

Column 10: chlorophyll (shifting average, 5m)

K_z is inferred from the formulation given by Shih et al (2005) that depends on turbulent intensity, $I = \epsilon/(\nu N^2)$ where ν is the molecular viscosity.

For moderate values of I, $I < 100$, K_z is given by the classical Osborn relationship:

$$K_z = \Gamma \epsilon N^{-2} \tag{1}$$

where Γ is a mixing efficiency, set here to 0.2.

Instead for higher turbulent intensities, in which case this Osborn relationship over-estimates K_z, K_z is given by:

$$K_z = 2\nu \left(\frac{\varepsilon}{\nu N^2}\right)^{\frac{1}{2}} \tag{2}$$

Dissipation rate from sensors 1 and 2 are inferred from rockland matlab software, when irrealistic values dissipation rate is set to Nan, there are given in columns 5 and 6. Most of the post-processing 'cleaning' has been done manually, by checking that the shape of the shear spectra is not 'noise' contaminated, i.e. that there is no spurious effect of the VMP cable.

When the two sensors give a value that falls within a factor of 2, ϵ (column 4), is set to the average of the two estimates.

The $5m$ shifting average of ϵ is given in column 3.

Temperature and salinity from the SBE CTD are given in columns 7 and 8 respectively, for both a 5m shifting average has been applied, this ensures a better quality of the salinity estimate as there is no pump on the conductivity.

The 5m shifting average of the buoyancy frequency square is given in column 9.

The 5m shifting average of the fluorescence is given in column 10. Values below 300dbar have been set to Nan, otherwise no specific treatment of the data (a few profiles are clearly not realistic).