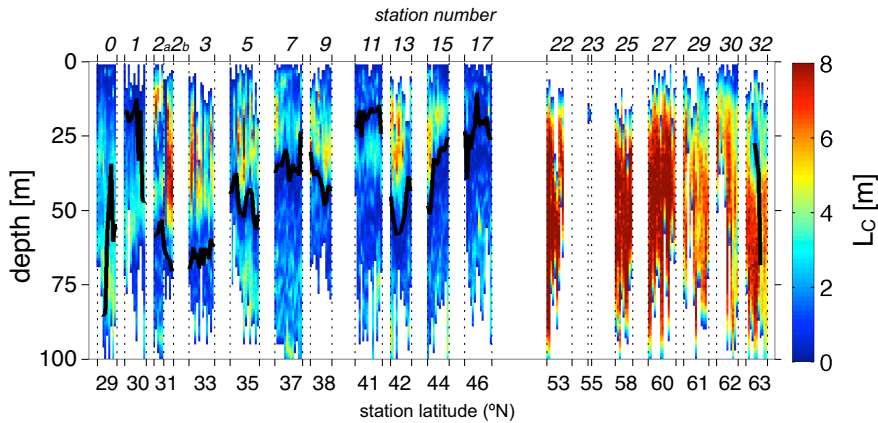
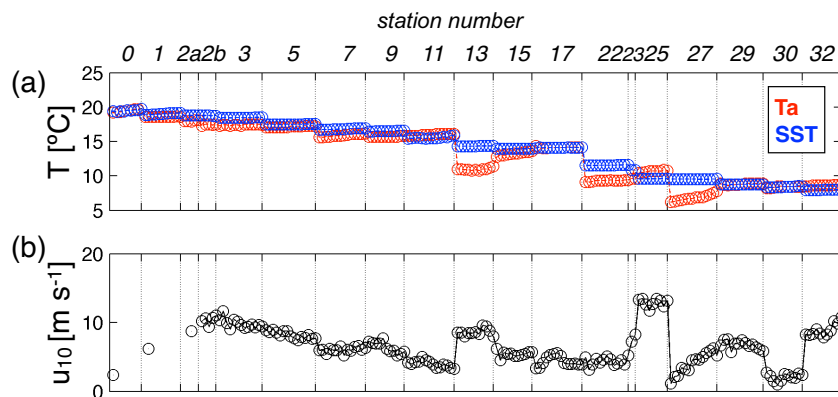


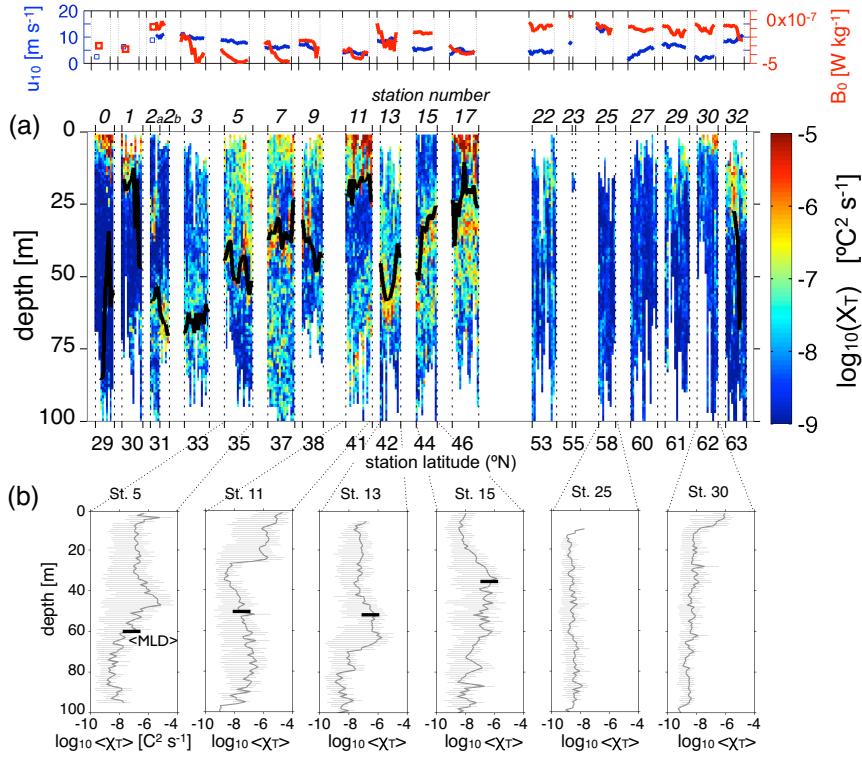
## Supplementary Material



**Fig. SM1.** Depth-binned profiles of centered length scale,  $L_C$ , derived from the SCAMP measurements along the transect. Station numbers are labelled in the top axis, and the corresponding latitude is shown in the bottom axis. The mixed layer depth (MLD) for each cast is also plotted as the thick black curve.  $L_C$  is a statistical measure of the vertical scale of the overturning eddies and it is essentially a version of the Thorpe scale. Values of  $L_C$  have been derived by (i) first applying a low pass filter on the density profile to account for sensor spatial resolution, (ii) sorting to obtain a monotonic density profile, (iii) placing the scale at the mid-point of the resorting length scale, and finally (iv) bin-averaging the results (Imberger and Boashash, 1986).



**Fig. SM2.** Meteorological data averaged over the time of each SCAMP profile: (a) air temperature  $T_a$  (at  $\sim 18.6$  m height) and sea surface temperature SST, (b) wind speed at 10 m height  $u_{10}$ . Each dotted vertical line indicates the last profile of the sampling station. The number of the corresponding station is shown at the top of the figure.



**Fig. SM3.** Depth-binned profiles of temperature dissipation rate  $\chi_T$  (a), and station-averaged profiles at representative stations (b). The ranges of minimum and maximum values around the station-average are also shown. The wind speed at 10 m height  $u_{10}$  and the net surface buoyancy flux  $B_0$  are shown in the top panel. Station numbers are labelled in the top axis, and the corresponding latitude is shown in the bottom axis. The mixed layer depth (MLD) for each cast is also plotted as the thick black curve. The angle brackets indicate a station-average.