

Sub-surface fine scale patterns in an anticyclonic eddy off Cap-Vert peninsula observed from glider measurements

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Glider hydrological data adjustment and validation

Introduction

The AWA CTD profile (#42) has been carried out at the GLISEN glider deployment point (17.7°W – 14.7°N) on 12 March 2014 20:00 PM on the French R.V. Atalante, the same day as the glider deployment, that occurred at 12:00 PM from a fishing boat. The CTD profile #42 has been compared with an ensemble of about 20 profiles carried out with the glider during 24 hours after the deployment (Fig. S.1; left panel). The glider/CTD temperature and salinity profiles have been compared (Fig. S.1, right panels). Between 200-300 m depth the temperature and salinity RMSD has been computed: the glider's temperature (salinity) was cooler (saltier) than the ship's by about 0.09°C (0.03 pss). Only a salinity offset correction of 0.03 pss was applied to the glider profiles as the temperature difference was small.

The IFM02 glider has been compared with an on-board CTD-O2 during the first profiles after the deployment on M105 cruises on board of the German R.V. Meteor. After correction of very small salinity and dissolved oxygen offset of -0.011 pss -3 $\mu\text{mol kg}^{-1}$, the glider measurements show good agreements with the CTD cast (Figure S.2).

After these corrections, T/S profiles from IFM02 and GLISEN were in good agreement. (Fig. S.3). This gives us confidence with the glider measurements from both GLISEN and IFM02.

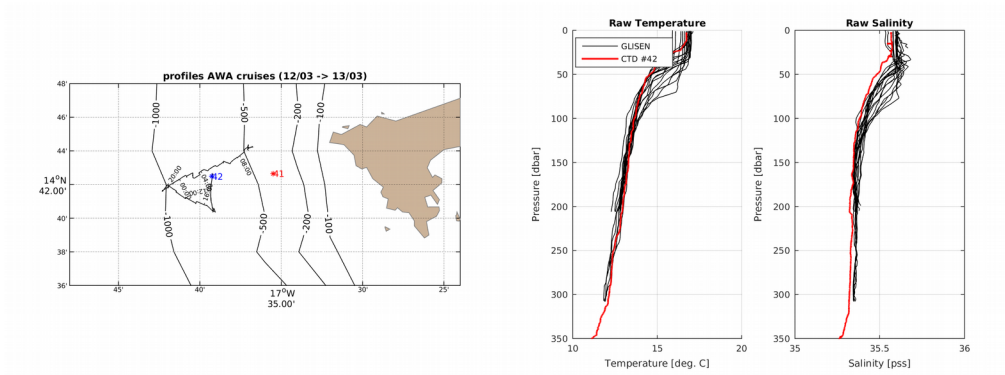


Figure S1. (Left) Position of the first 20 profiles of the GLISEN glider (black segments) and of the AWA CTD #41 and #42 off the Cap-Vert Peninsula on 12-13 March 2014. (Right) Comparison between the GLISEN 20 first raw (uncorrected) temperature and salinity profiles, and temperature and salinity from the ship's CTD cast #42 (red).

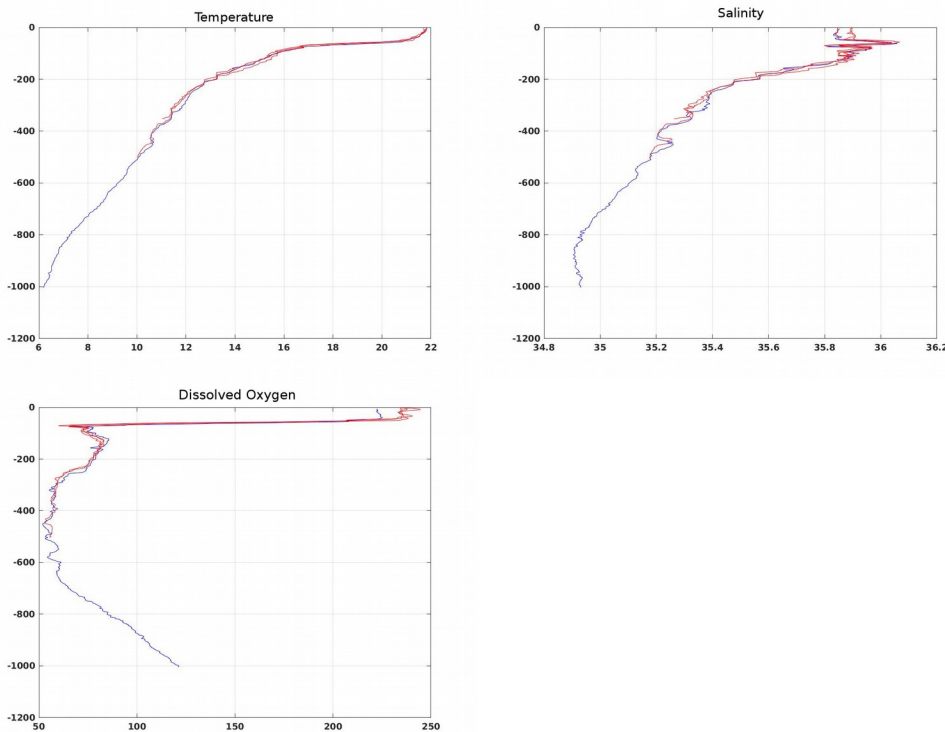


Figure S2. Comparison between collocated CTD-O2 temperature ($^{\circ}\text{C}$), salinity (pss) and dissolved oxygen ($\mu\text{mol kg}^{-3}$) made on-board the R.V. Meteor used for deployment (blue), and from IFM02 glider (red).

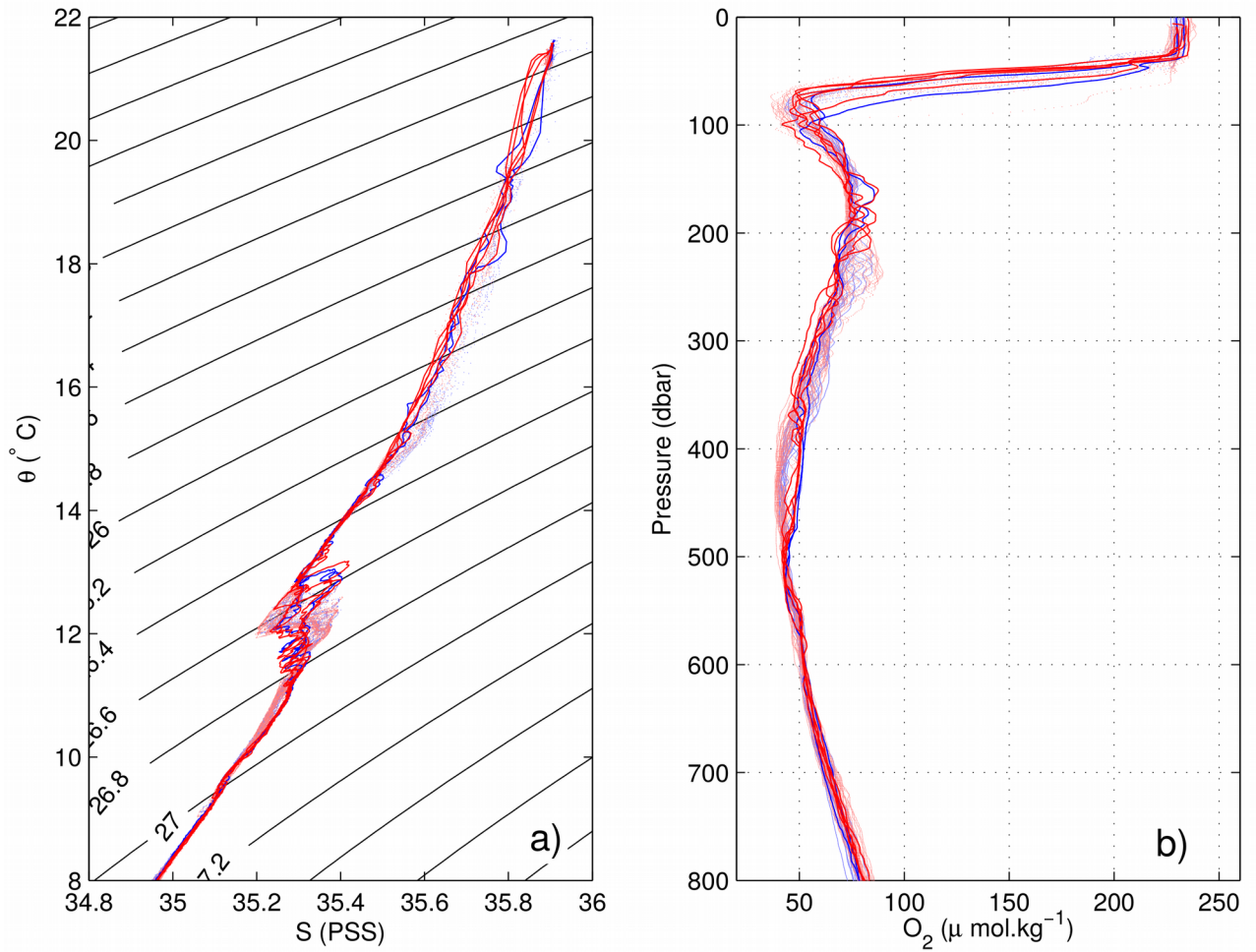


Figure S3. a) θ - S profiles over the overlapping section (dotted) between 20.7°W and 19.9°W, and 2 most colocated up-down profiles (solid) from GLISEN (blue) and DEPL21 (red) glider. b) Same as Fig.2a except for oxygen-depth profiles.