

Analysis of the R/V Bilim LIWEX data

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The results presented here were obtained during the February 1995 cruise of R/V Bilim, as part of the POEM Levantine Intermediate Water Experiment, carried out during January-April 1995. The region covered by R/V Bilim and the station network is shown in Fig.1. The cruise was carried out between 10-17 February.

The OA geopotential anomaly (in cm units) at 20, 100, 200 and 300 db, Fig.2, indicate the well known features of the circulation: the Asia Minor Current near the coast, the cyclonic Rhodes gyre, the mid-Mediterranean Jet, and a part of the anticyclonic Mersa Metruh Gyre. The intensity of the circulation decreases with depth; below the 600 db level (not shown), the features can be hardly distinguished.

The T-S diagram for all stations, Fig.3, shows two distinct subsurface salinity maxima. The maximum at density 28.95 (density refers to the potential density parameter sigma-theta and temperature to potential temperature) corresponds to stations located at 36 N, near the coast. The temperature and salinity of this water mass (T=16.0 and S=39.15 approximately) are higher than the characteristics values of LIW.

The other maximum is at density 29.0 (T=15.25, S=39.05), and corresponds to the LIW at stations between latitudes 33 N - 34.5 N.

The spreading of these two water masses can be seen in the distribution of salinity on isopycnal surfaces of 28.95 and 29.00, Fig.4 a-b. Pathways are indicated by arrows. The

warmer and more saline intermediate water mass, in the region near the coast, moves towards the northwest, along the periphery of the RG. The LIW in the south spreads towards the northeast, almost along the northern limit of the MMG. A part of the LIW also moves west, along latitude 33.5 N. The northern and the southern intermediate water masses are separated by a front between 34.5 N and 35.5 N.

A chimney formation was observed in the RG during the Meteor cruise. By the time of the Bilim cruise, the chimney had become essentially homogenous in the depth range of 50-800 m, as seen in the sections, Fig.5. The properties of the homogenous water mass in the chimney are: $T=13.95$, $S=38.85$, and density= 29.18 .

The lower half of the chimney is more saline and warmer, while the upper half is less saline and cooler than at neighboring stations. Therefore, the chimney was formed due to mixing of water sinking from the surface and the water upwelling from the base of the Rhodes gyre.

Station locations

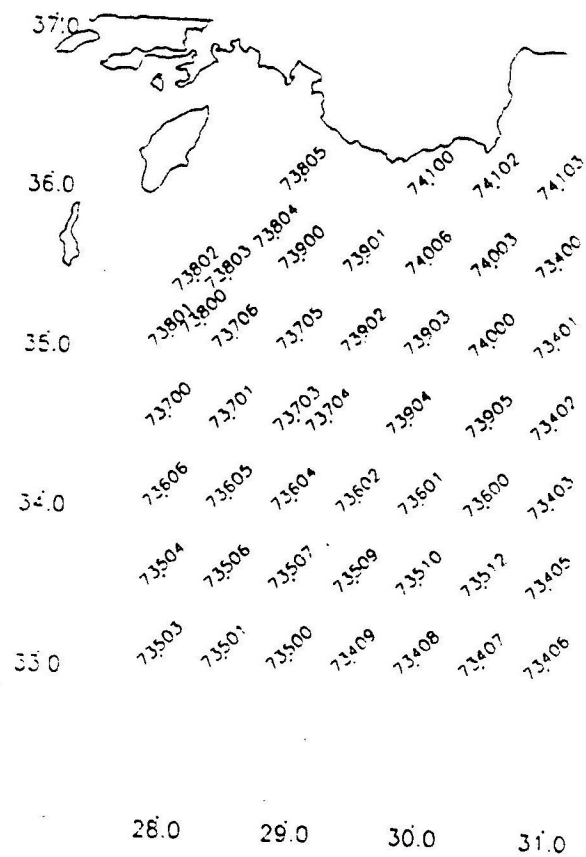


Figure 1. Station network of R/V Bilim cruise

Bilim, T-S, all stations

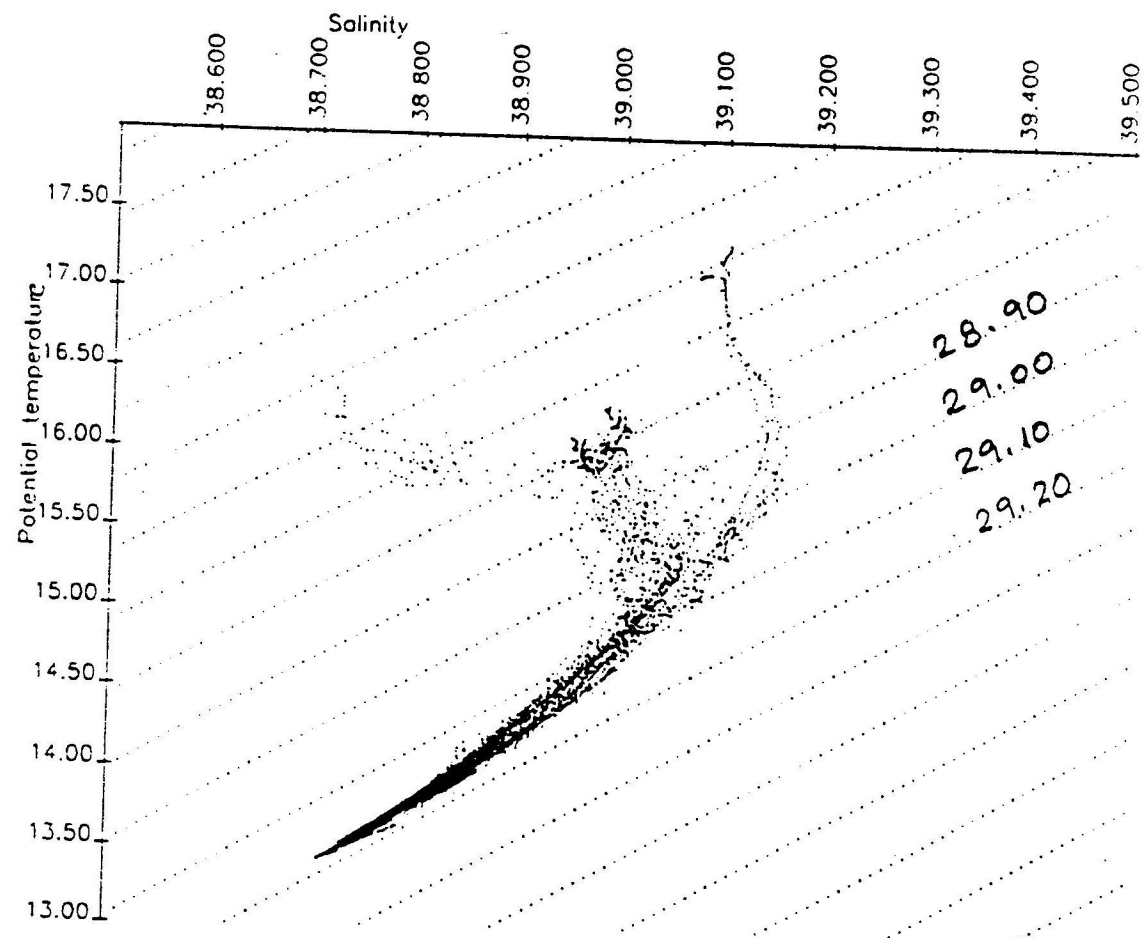


Figure 2. T-S diagram for all stations

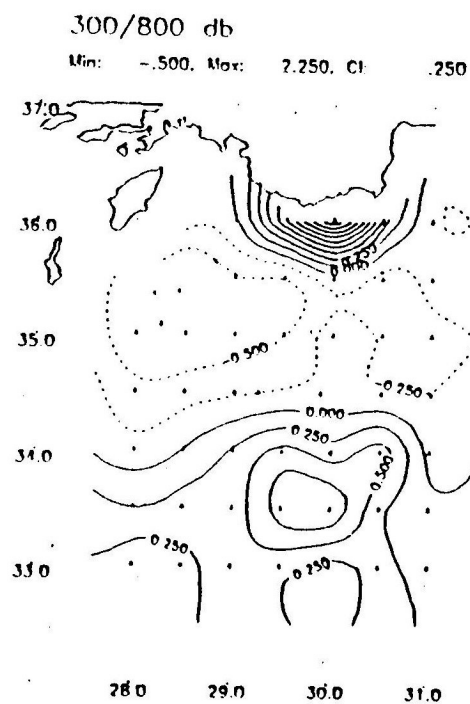
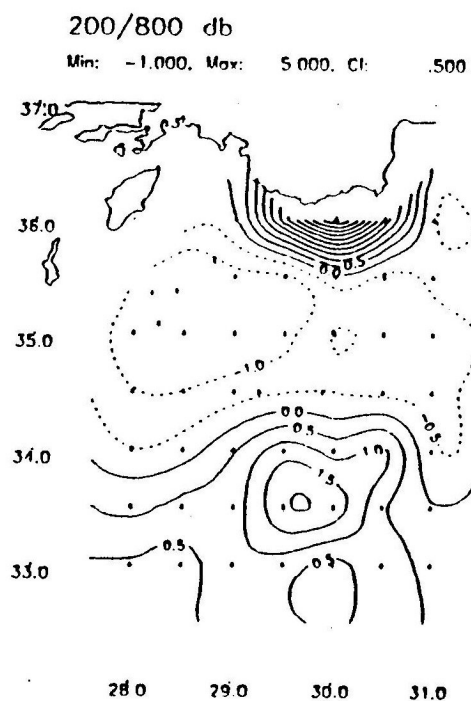
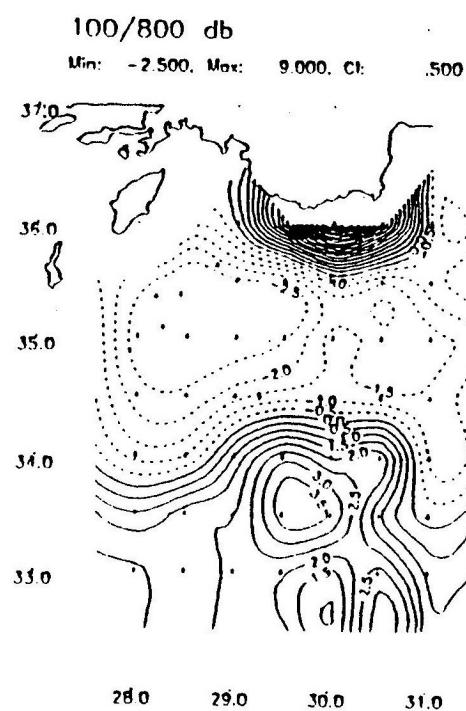
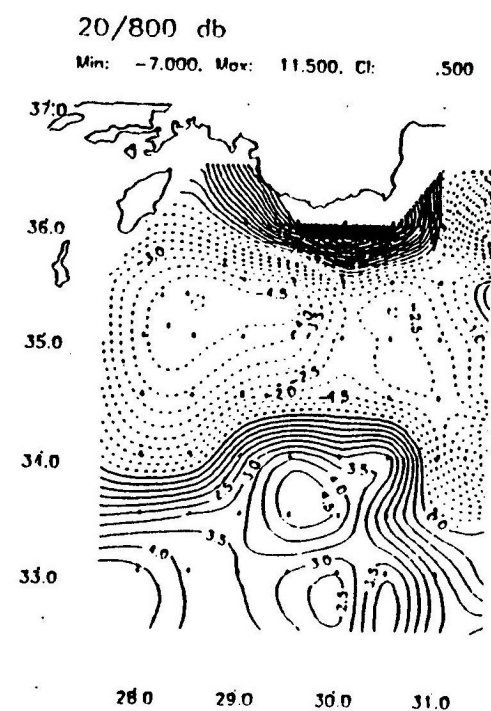
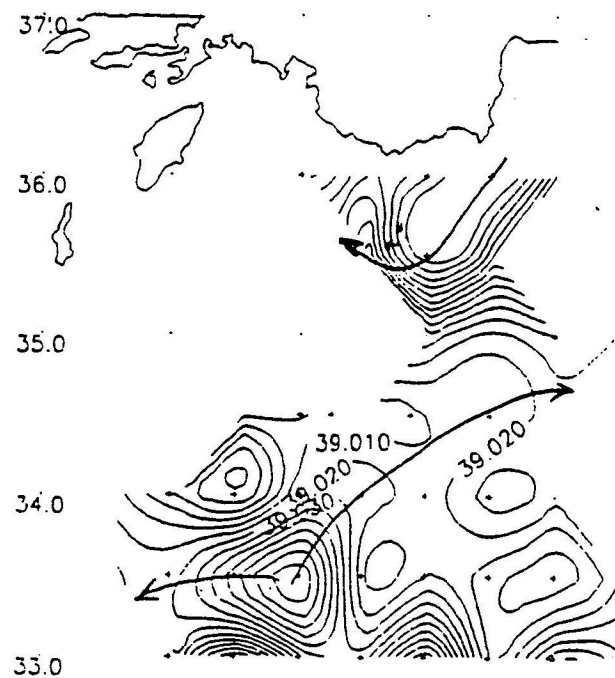


Figure 3. Geopotential anamoly maps, reference level=800 db

Salinity at density 28.95

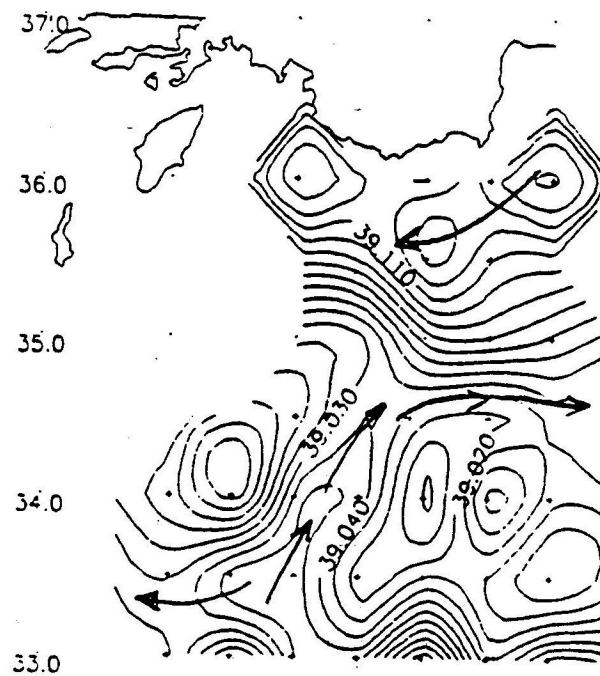
Min: 38.960, Max: 39.150, Cl: .010



(a)

Salinity at density 29.00

Min: 38.970, Max: 39.150, Cl: .010



(b)

Figure 4. Salinity distribution on isopycnal surfaces

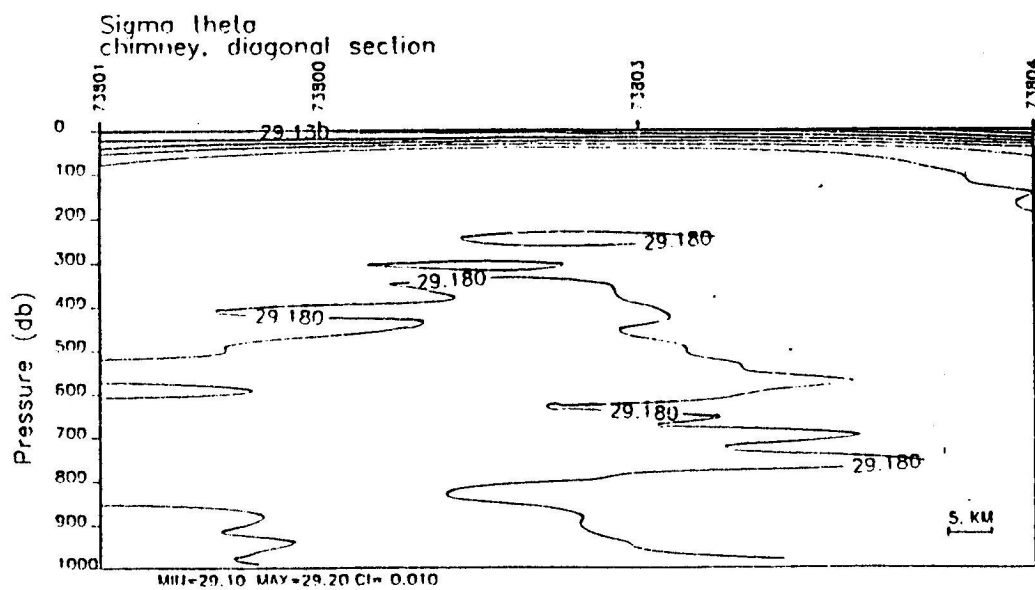
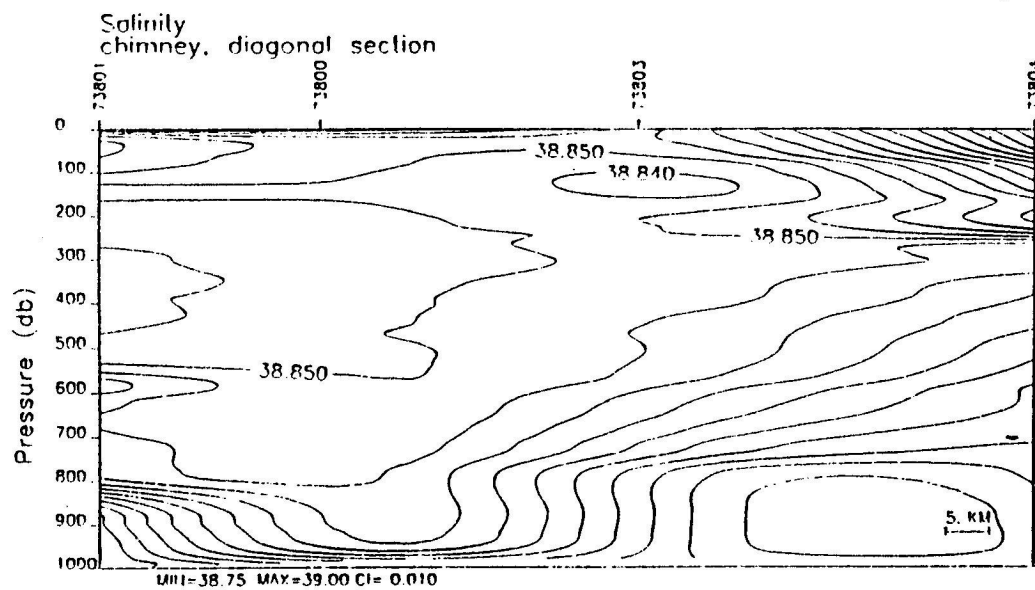
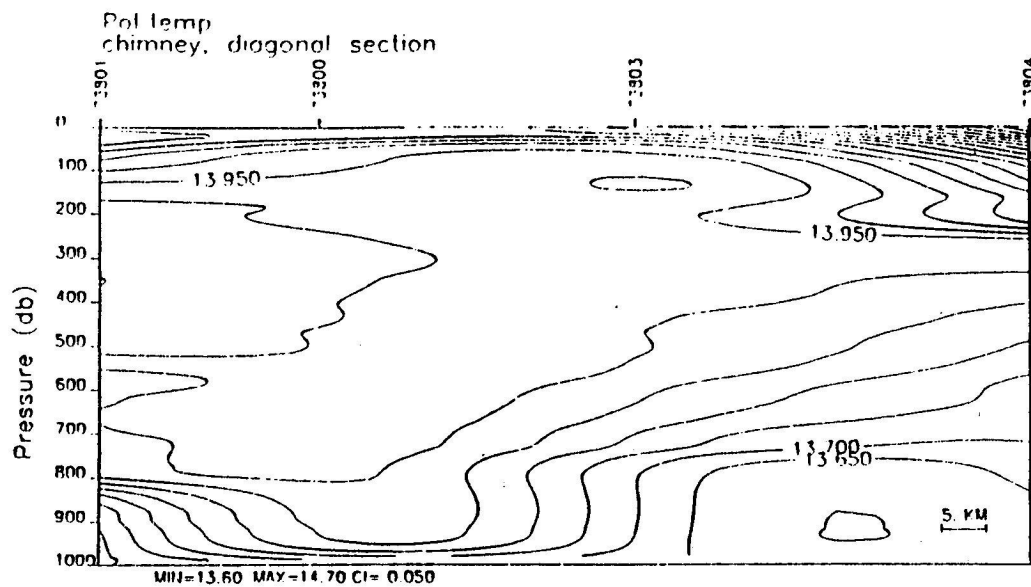


Figure 5. Property sections across the RG chimney

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