

## Double diffusive activities in the Cretan Sea during late Summer 1987

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The profiles of the hydrological characteristics (T,S) finestructure are examined in the Cretan Sea during the POEM-5 cruise, September - October 1987. CTD (SBE-9) data from 20 stations (Fig.1) averaged to 1 data per second of the original data which sampled at 33 Hz with a lowering speed of about 0.75 m/sec. The data interpolated with 1 dbar spacing and then are used for different finestructure analyses.

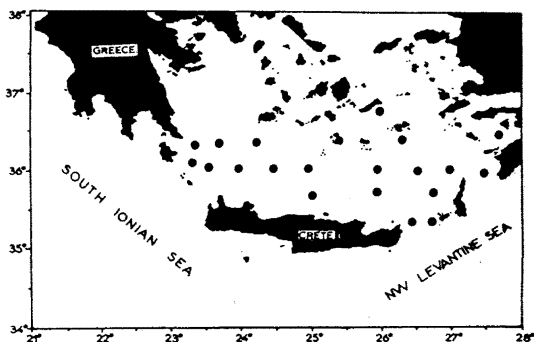


Fig.1 The study area showing the location of the hydrographic stations during the POEM-5 cruise.

One of the mechanisms that can generate the finestructure of the T-S characteristics is the double diffusive convection (Fedorov 1978, Karlin 1988 et al.). Generally is considered that the double diffusion and especially the salt fingering is an important process for the vertical transportation of heat and salt in the water column resulted by the different values of  $\alpha$  and  $\beta$  coefficients (Turner 1985).

To find the nature and the strength of double diffusive activities, in the Cretan Sea, the parameter of Turner angle ( $Tu$ ) is computed at depths between 100-500 dbars.

The observed profiles structure, at the majority of the examined depth interval, indicate that salt fingering process might be occurred. The hydrological conditions of the water at the above water columns are warm and saline water overlying colder less saline water, characterized as LIW of Cretan Sea. Turner angle profiles verify the prevalence of the salt fingering regime.

The stability regimes of double - diffusion (salt fingering, diffusive, stable, unstable), for all stations in the investigated area, are illustrated in the Turner angle ( $Tu$ ) histogram (Fig.2). The stippled areas indicate the salt fingering and diffusive layering portions. The maximum  $Tu$  volume of 58% corresponding to the salt fingering while only 11% for the diffusive convection.

The above vertical distribution of  $Tu$  shows the predominance role of salt fingering process in the formation of the finestructure of Cretan water at intermediate depths.

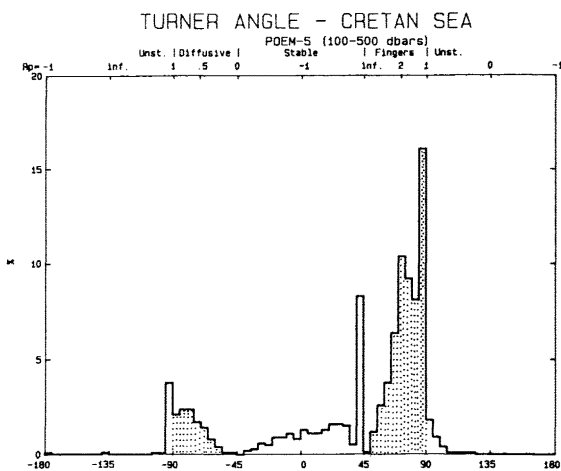


Fig.2 Turner angle histogram with the stability regimes of double - diffusion for all stations in the Cretan Sea, late summer 1987.

### REFERENCES

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 Turner J.S., Convection in Multicomponent Systems, Naturwissenschaften, 72, N.2, 70-75pp.