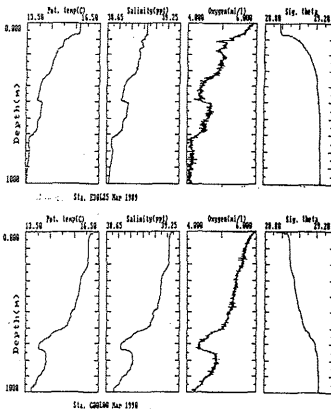


Large scale inversions in the North Levantine Basin

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Measurements carried out by R/V Bilim during 1988-1990 in the north east Levantine basin show inversions associated with large scale intrusions of anomalous water masses at depths between 500-900 m. The thickness of the intrusions is between 100 m and 200 m, and they are observed primarily in the fronts between the Rhodes cyclonic gyre and the adjacent anticyclonic eddies. The measurements were taken with a SBE-9 CTD continuous profiling system. The temperature and salinity values of the intrusions differentiate them from the well known Levantine intermediate water (LIW). Both warm and cold intrusions have been observed. The warm water intrusions have relatively higher oxygen than the ambient water; the opposite is true for the cold intrusions. Examples of a warm and a cold intrusion are shown below. At station E30L25 ($N34^{\circ}30'$, $E29^{\circ}25'$), the intrusion layer is located between 500 m and 700 m; its temperature and salinity are higher by 0.2°C and 0.08 ppt, than the ambient. The intrusion at station G00L30 ($N36^{\circ}$, $E29^{\circ}30'$) extends between 600 m and 750 m, and its temperature and salinity are lower by 0.3°C and 0.1 ppt than the ambient. The potential density profile shows that the intrusions are hydrostatically stable.



The temperature, salinity and the oxygen content indicate that the cold intrusions result from lateral sliding of the upwelling water of the Rhodes gyre towards the periphery of the gyre. The sources of the warm intrusions are the two anticyclonic gyres centered approximately at $N34^{\circ}E30'$, and at $N36^{\circ}E30'-30'$. While the main intrusion layer is stable, Brunt Vaisla frequency plots show that the interface regions are unstable, implying a gradual mixing between the two water masses.