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Thermohaline structure of the Black Sea as inferred from Argo floats

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The mixed layer, Cold Intermediate Layer (shallow temperature minimum) and the surface layer properties of the Black Sea have been examined using data available from seven Argo floats deployed in 2002-2009 by the Middle East Technical University (Turkey) in collaboration with the University of Washington (U.S.A) and the Marine Hydrophysical Institute (Ukraine) . Temperature data from these floats show distinct interannual variability in the surface layer of the Black Sea, whereas the salinity data reveals spatial changes due to freshwater input. The analyses of the Cold Intermediate Layer (CIL) demonstrates strong periodic variation in the depth of the CIL and changes in the mean temperature of the CIL over time. The CIL was detected down to over 100 meters depth which has not been observed before. The properties at 100 m and 200 m were also analyzed and this study showed distinct features depending on the float positions, which in comparison with satellite altimetry indicate that the features are observed when floats are entrained in cyclonic or anticyclonic eddies. This is the first time that such a comprehensive data set was available for the Black Sea and this data set allows us to see previously unknown features of the Black Sea thermohaline structure.