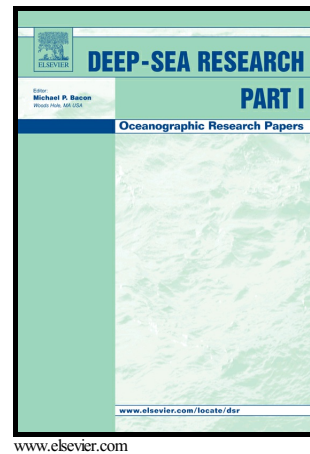


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Observing the subsurface thermal signature of the Black Sea Cold Intermediate Layer with Argo profiling floats

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**Observing the subsurface thermal signature of the Black Sea Cold****Intermediate Layer with Argo profiling floats****Anil Akpınar\*, Bettina A. Fach, Temel Oguz**

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**Abstract**

Cold intermediate layers (CILs) constitute a key indicator of the subsurface thermal signature in many marginal and subarctic seas. Towards better understanding the impacts of natural and anthropogenic climate variability in the Black Sea, the present study elucidates processes leading to the observed changes of CIL characteristics at mesoscale and monthly-to-interannual scales by analyzing weekly temperature-salinity profiles provided by Argo floats for 2002-2015. The continuous time series data allowed to elucidate different types of CIL formation episodes. For the first time, it was possible to trace their subsequent evolution depending on the number and intensity of successive, but often intermittent, autumn-winter cooling events in addition to the ambient flow and stratification characteristics within the cyclonic interior and anticyclonic coastal eddies/gyres. The spatial distribution of CIL formation in the cold years 2003, 2006 and 2012 covered much of the Black Sea, even coastal anticyclonic eddies as a new feature which has not been documented before. The data also recorded modification of CIL during the rest of the year in terms of its thickness, position, temperature and salinity ranges in response to advective transport by the circulation system,

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