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The Madeira Mode Water

Gerold Siedler, Anni Kuhl, and Walter Zenk

Institut für Meereskunde, Kiel University, 2300 Kiel, F.R. Germany

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ABSTRACT

Quasi-homogeneous layers in vertical profiles of temperature and salinity in the eastern North Atlantic near Madeira indicate the existence of a subtropical Mode Water in the Eastern Basin. Temperature sections show a maximum horizontal extent of at least 500 km. The frequency distribution analysis of homogeneous layers in a historical XBT dataset shows a Mode Water formation region near and to the north of Madeira. This Mode Water is found at increasing depths and displaced to the west and southwest during the course of the year after its formation by wintertime convection. It disappears almost completely, due to mixing, before the next winter. Volume estimates suggest that this Madeira Mode Water in the eastern Atlantic accounts for 15–20% of the total Central Water formation in the corresponding density range as obtained from tracer studies in the North Atlantic gyre.

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