



Abstract View

[Volume 13, Issue 8 \(August 1983\)](#)

Journal of Physical Oceanography

Article: pp. 1430–1440 | [Abstract](#) | [PDF \(744K\)](#)

Benthic Observations on the Madeira Abyssal Plain: Fronts

S.A. Thorpe

Institute of Oceanographic Sciences, Wormley, Godalming, Surrey, England

(Manuscript received January 12, 1983, in final form March 16, 1983)

DOI: 10.1175/1520-0485(1983)013<1430:BOOTMA>2.0.CO;2

ABSTRACT

Analysis of data from a mooring with five vector-averaging current meters between 10 and 70 m above the bed of the Madeira Abyssal Plain reveals the existence of narrow regions with relatively large gradients of potential temperature, or “fronts.” The orientation and structure of the fronts is examined by combining the temperature and current data and plotting contours of equal potential temperature on the progressive vector diagrams, a procedure justified because of the known horizontal coherence of the currents and the relatively long time-scales of evolution of the benthic boundary layer. Sections through the fronts show that they are typically ~ 300 m in width. They extend horizontally for at least 8 km. The temperature differences across the observed fronts are only 2–4 mdeg C. The frontal surfaces are tilted at ~ 10 deg to the horizontal, the observed cold fronts being steeper and with isotherms more closely compacted in the lower levels, than warm fronts. These features possibly result from the straining of the temperature field by mesoscale motions as proposed by Armi and D’Asaro.

Options:

- [Create Reference](#)
- [Email this Article](#)
- [Add to MyArchive](#)
- [Search AMS Glossary](#)

Search CrossRef for:

- [Articles Citing This Article](#)

Search Google Scholar for:

- [S.A. Thorpe](#)



DC Office: 1120 G Street, NW, Suite 800 Washington DC, 20005-3826
amsinfo@ametsoc.org Phone: 617-227-2425 Fax: 617-742-8718
[Allen Press, Inc.](#) assists in the online publication of *AMS* journals.