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Unstructured meshes in large-scale ocean modeling. (English) Zbl 1197.86006

Freeden, Willi (ed.) et al., Handbook of geomathematics. 2 Volumes. Berlin: Springer (ISBN 978-3-642-01545-8/hbk; 978-3-642-01546-5/ebook; 978-3-642-01547-2). 371-398 (2010).

This article will not be reviewed individually. See also the complete volume [Zbl 1201.86001]. Summary: The current status of large-scale ocean modeling on unstructured meshes is discussed in the context of climate applications. Our review is based on FEOM, which is at present the only general circulation model on a triangular mesh with a proven record of global applications. Different setups are considered including some promising alternative finite-element and finite-volume configurations. The focus is on consistency and performance issues which are much easier to achieve with finite-volume methods. On the other hand, they sometimes suffer from numerical modes and require more research before they can be generally recommended for modeling of the general circulation.

For the entire collection see [Zbl 1201.86001].

MSC:

86-00 General reference works (handbooks, dictionaries, bibliographies, etc.) pertaining to geophysics
86A05 Hydrology, hydrography, oceanography
76M25 Other numerical methods (fluid mechanics) (MSC2010)

Full Text: DOI