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由GOCE引力场模型和CNES-CLS2010平均海面高计算的稳态海面地形

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Mean dynamic topography calculated by GOCE gravity field model and CNES-CLS2010 mean sea surface height

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摘要

利用欧空局发布的三组GOCE引力场模型及CNES-CLS 2010平均海面高数据,计算得到了全球的稳态海面地形,进而得到了全球地转流速度图.在此基础上重点对黑潮进行了对比分析.结果表明:GOCE不同组解的稳定性较好,所计算的稳态海面地形的差异基本在厘米量级内,这间接表明了GOCE引力场模型提供的大地水准面的精度达到了厘米量级.此外,通过将GOCE与GRACE相应结果进行对比发现,GOCE可提供更多的局部信息,特别是对于流速快、水流窄的边界流,如黑潮、墨西哥湾流等,GOCE所得结果更加清晰,速度也更精确.

关键词 GOCE引力场模型, 稳态海面地形, 洋流

Abstract:

Global mean dynamic topographies (MDT) are computed with three groups of GOCE gravity field models and CNES-CLS2010 mean sea surface height (MSS), and then geostrophic surface currents are also computed. Finally Kuroshio is analyzed emphatically. The results show that the different GOCE gravity field models are stable, i.e., the differences of MDT calculated using different GOCE gravity field models are all less than several centimeters. It indicates the accuracy of geoid provided by GOCE arrives at magnitude of centimeter. The comparison with GRACE shows that GOCE can provide more local information of the currents. Especially for the boundary currents such as Kuroshio and the Gulf Stream which are fast and narrow, the result from GOCE is much clearer and the velocity is more accurate. Hence, GOCE is more appropriate for research on the currents than GRACE.

Keywords GOCE gravity field model, Mean dynamic topography, Ocean current

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