热带海洋学报
JOURNAL OF TROPICAL OCEANOGRAPHY

热带海洋学报 » 2011, Vol. 30 » Issue (6) :1-9

基于INSTANT数据对ITF流出海峡海流的功率谱分析

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摘要 利用INSTANT(The International Nusantara Stratification and Transport, 努沙登加拉层结及输运的国际联合观测计划)计划所测得的流场数据, 研究了ITF (Indonesian Throughflow, 印度尼西亚贯穿流)在主要流出海峡——龙目海峡(Lombok Strait)、翁拜海峡(Ombai Strait)和帝汶海峡(Timor Passage) 随深度和时间的变化, 并对表层和温跃层的流速进行了功率谱分析。研究发现, ITF流场在龙目和翁拜海峡表层有显著的年循环, 在季风转换期间各个层次上海流都会出现反转, 从印度洋流向海峡内; 而帝汶海峡在300m以下出现反转流。3个海峡的表层流都以年周期为主, 温跃层的流以半年变化为主, 并且都有丰富的季节内变化。高频部分, 除了在龙目海峡表层K_1日潮占优外, 各海峡均以M_2半日潮为主。

关键词: 努沙登加拉层结及输运的国际联合观测计划(INSTANT) 印度尼西亚贯穿流(ITF) 功率谱分析

Abstract: The observational data from the International Nusantara Stratification and Transport (INSTANT) Program is used to investigate the variation of the Indonesian Throughflow (ITF). Specifically, the power spectrum of the flow in surface and thermocline layers in the three major outflow passages is analyzed. The results show that the flow in the surface layer of the Lombok and Ombai straits has an obvious annual cycle. During the monsoon transition period, the flow reverses at all depths at the Lombok and Ombai straits, whereas the current reveres only below 300 m in the Timor Passage. The variations of the currents in both surface and thermocline layers are high at intraseasonal time scale. The annual cycle is prevalent in surface layer, while the semiannual cycle dominates in thermocline layer. At tidal frequencies, each strait shows that the semi-diurnal tide M_2 is dominant expect for the surface layer of the Lombok Strait where the diurnal tide K_1 is dominant.

Keywords: International Nusantara Stratification and Transport (INSTANT), Indonesian Throughflow (ITF), power spectrum

收稿日期: 2010-05-31;

基金资助:

中国科学院知识创新工程项目(KZCX2-YW-BR-04); 科技部项目(2010CB950302、2008AA09A402); 国家自然科学基金项目(41176024)

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引用本文:

刘凯, 孙照渤, 杜岩 .基于INSTANT数据对ITF流出海峡海流的功率谱分析[J] 热带海洋学报, 2011,V30(6): 1-9

LIU Kai, SUN Zhao-Bo, DU Yan .Power spectrum analysis of Indonesian Throughflow based on INSTANT data[J] Journal of Tropical Oceanography, 2011,V30(6): 1-9

链接本文:

http://www.jto.ac.cn/CN/ **或** http://www.jto.ac.cn/CN/Y2011/V30/I6/1

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