

Research Group of western boundary currents in the tropical Pacific
Institute of Oceanology, Chinese Academy of Sciences



王凡研究员2016年在CLIVAR国际开放大会上做有关NPOCE特邀报告
Wang Fan presented invited talk at CLIVAR Open Science Conference in 2016

The group discovered the Mindanao Undercurrent, Luzon Undercurrent and North Equatorial Undercurrent, revealed the origin and structure of the undercurrent system, and proposed dynamic mechanism for the formation of these undercurrents. They carried out a series of observations with a huge number of subsurface moorings, which are recognized as the largest mooring array in the region with swift currents and steep topography. On the basis of the mooring array they measured the multi-scale variability of these undercurrents directly. The above findings have advanced the western Pacific ocean circulation study from 2-D into 3-D stages, fundamentally changed traditional understanding framework, made a key breakthrough in this research direction, and inaugurated a new research field. The group initialized the NPOCE international program, and published the first Nature review paper on the Pacific Ocean circulation. The achievement above caused far-ranging international influence, established guiding role of China in the field of western tropical Pacific circulation study, and realized historic leap from following to leading in this field.

Outstanding contributors of this research group

Hu Dunxin

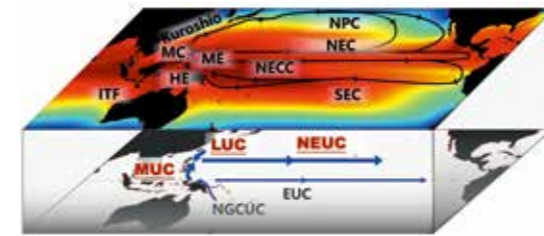
Discovered the Mindanao Undercurrent, Luzon Undercurrent and North Equatorial Undercurrent, and revealed their multi-scale variabilities. Initiated international program "Northwestern Pacific Ocean Circulation and Climate Experiment" (NPOCE), and founded leading role of China in this research field.

Wang Fan

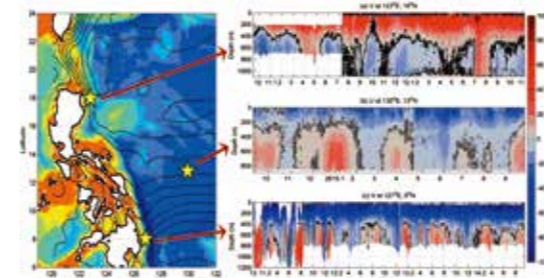
Proposed the formation mechanism and theory of the western boundary undercurrents, and constructed the largest mooring observation array of tropical western Pacific in the world.



胡敦欣院士在2012年西北太平洋海洋环流与气候实验启动大会做主题报告
Hu Dunxin provided keynote speech on NPOCE inauguration meeting in 2012



热带西太平洋环流示意图, 其中红色标注的是棉兰老潜流 (MUC)、吕宋潜流 (LUC) 和北赤道潜流 (NEUC)
Schematic of ocean circulation in the western tropical Pacific, and the MUC, LUC and NEUC are highlighted in red.



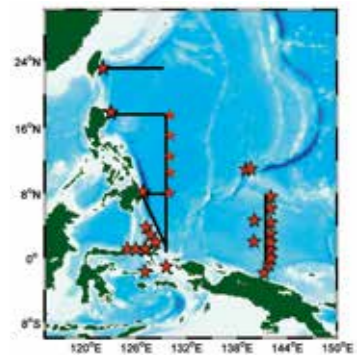
潜标观测时间序列: 棉兰老潜流(c)、北赤道潜流(b)、吕宋潜流(a)
Time series of Mindanao Undercurrent (c MUC), North Equatorial Undercurrent (b NEUC) and Luzon Undercurrent (a LUC) measured by subsurface moorings.

热带太平洋西边界流研究集体

推荐单位: 中国科学院海洋研究所

研究集体主要科技贡献:

该研究集体发现了棉兰老潜流、吕宋潜流和北赤道潜流, 揭示了该潜流系统的起源和结构, 提出了潜流形成机制、理论。在潜标观测“禁区”构建了国际上最大规模的热带西太平洋潜标观测阵列, 首次直接观测到三支潜流及其多尺度变异。上述成果将西太平洋环流研究从二维推进到三维, 从根本上改变了传统的认知框架, 取得了该研究领域的重大突破, 开辟了新的研究方向。该集体成功发起NPOCE国际计划, 在Nature杂志领衔发表首篇有关太平洋环流研究述评, 产生了广泛的国际影响, 奠定了我国在西太平洋环流研究领域的核心地位, 实现了从跟踪到引领的历史性跨越。



热带西太平洋潜标观测阵列
Observation mooring arrays in the western tropical Pacific

研究集体突出贡献者



胡敦欣 Hu Dunxin

胡敦欣 中国科学院海洋研究所

主要科技贡献: 发现棉兰老潜流、吕宋潜流和北赤道潜流, 揭示潜流的多尺度变异, 发起NPOCE国际计划, 奠定我国在该领域的引领地位。



王凡 Wang Fan

王凡 中国科学院海洋研究所

主要科技贡献: 提出西边界潜流形成机制、理论, 构建了国际上最大规模的热带西太平洋潜标观测阵列。

研究集体主要完成者

袁东亮 张林林 胡石建 王庆业 王富军 汪嘉宁 李元龙 高山
冯俊乔 贾凡 刁新源 周慧 李峤 赵君 王铮



在Nature杂志发表关于太平洋西边界流及其气候效应的述评论文
Published Nature review paper on Pacific western boundary currents and their roles in climate

Major contributors

- Yuan Dongliang
- Zhang Linlin
- Hu Shijian
- Wang Qingye
- Wang Fujun
- Wang Jianing
- Li Yuanlong
- Gao Shan
- Feng Junqiao
- Jia Fan
- Diao Xinyuan
- Zhou Hui
- Li Yao
- Zhao Jun
- Wang Zheng



西北太平洋海洋环流与气候实验 (NPOCE) 启动大会和NPOCE科学执行计划
NPOCE inauguration meeting and its Science/Implementation Plan



1988年胡敦欣在《科学一号》船上与美国专家Norge Larson博士讨论具体观测问题
In 1988 Prof. Hu Dunxin with Dr. Norge Larson on R/V Science I discussing about observations.



2010年西太平洋考察期间王凡研究员及其团队在《科学一号》上合影
Wang Fan (chief scientist) and his colleagues on board of R/V Science I during the western Pacific cruise in 2010.



2010年西太平洋6100米深海潜标布放中
Deployment of the 6100 m deep ocean mooring in the western Pacific in 2010