

## **Investigating Coastal Zone and Open Ocean Dynamics and Bio-Optical Conditions by Satellite Sensor Synergy in Combination With In-Situ Data and Simulation Models**

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The study will focus on:

- a) Estimating and monitoring the Yangtze River freshwater runoff (surface speed and speed variability) from the SAR based range Doppler shift anomaly observations.
- b) Monitoring of changes in shallow water bathymetry in the coastal zone region around Shanghai based on SAR observations in combination with dredging data and a simple 3D barotropic ocean simulation model.
- c) Develop and validate a regional-to-local phytoplankton retrieval algorithm that accounts for the local bio-optical conditions.
- d) Establish regional relationship between CDOM and salinity in vicinity of the Yangtze river mouth.
- e) Build on the DRAGONESS project achievement and findings regarding marine environmental monitoring and extend this into the Dragon 3 program phase from 2012 to 2016. This will in particular target Chinese marine environmental services and information products arising from integrated use of networks of remote sensing data from Chinese and European satellite data.

Satellite data will include ESA Envisat, Sentinel-1, Sentinel-3 and SMOS, complemented by Chinese satellite data (MERSI, etc.) and TPM such as Aqua MODIS, and possible Aquarius. The retrieval algorithms include the range Doppler shift method, CDOP wind retrieval method, chlorophyll a and CDOM retrieval algorithms.

The deliverable will include processing methods, simulation tools and retrieval algorithms as well as new scientific findings and achievements which will be published in Dragon 3 conference proceedings as well as in International Review Journals. The funding sources for this will be based on complementary research activities at the PI's and Co-PI's respective institutes and Dragon 2 and Dragon 3 Young scientist fellowships. Specific support for exchange of young scientists will also be provided.

## 基于多卫星传感器和数值模拟的河口近岸水动力 与生物光学研究

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### 研究要点：

(1) 应用基于SAR的距离向多普勒频移异常观测，估算和监测长江河口淡水径流量（表层流速和流速变化）；(2) 应用SAR观测，结合疏浚数据和简单3D正压海洋模拟模型，进行长江河口及近岸浅水地形变化监测研究；(3) 开发并验证一个用于建立长江口生物光学模型的“区域到局部”浮游生物提取算法；(4) 构建长江河口毗邻水域CDOM与盐度间的大尺度关系模型；(5) 在2012-2016的“龙计划3”期间，在DRAGONESS项目有关海洋环境监测研究成果和发现的基础上继续研究，重点针对集成应用中国和欧洲卫星遥感数据网络，为中国提供海洋环境服务和信息产品。

### 数据和方法：

本项目应用的卫星数据包括欧空局Envisat、Sentinel-1、Sentinel-3和SMOS数据，辅之于中国卫星数据（MERSI等）和包含Aqua MODIS和Aquarius在内的第三方卫星数据。拟研究的反演算法包括距离向多普勒频移方法、CDOP风场反演算法，叶绿素a和CDOM反演算法。

### 经费和成果：

支撑本项目研究的经费将来源于项目中欧双方负责人所在研究机构各自负责的科研项目，以及龙计划二期和三期的青年科学家基金；本项目还将为中欧青年科研人员交流寻求特别的支持。拟提交的研究成果包括处理方法、模拟工具、反演算法、和新的发现等成果，这些成果将发表在龙计划三期会议论文集和国际学术期刊上。