



Effects of physical forcing on timing and magnitude of the spring phytoplankton bloom on the open shelf of the Yellow Sea in 2009

Feng Zhou (1,2), Ji Liang Xuan (1), Da Ji Huang (1), and Cheng Gang Liu (1)

(1) State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography, State Oceanic Administration, Hangzhou 310012, China(zhoufeng@sio.org.cn, tel:086-571-81963089, fax:086-571-88839374), (2) Department of Fluid Mechanics, School of Aeronautics and Astronautics of Zhejiang University, Hangzhou 310027, China

Results are given of a serial of interdisciplinary survey of the subsurface chlorophyll a maximum (SCM) in the vicinity of the central trough of the Yellow Sea in winter-spring 2009. The survey, made in Feb-April, consists of two general investigations of the background conditions and then is followed by a 15-day track of the phytoplankton bloom. There are two sites of fluorescence exceeding statistically typical value 4 mg/m³ in succession. The first track is on the edge of the deep trough under the influence of the Yellow Sea Warm Current (Bloom Z11), the other is in the central region where is more stable in terms of hydrodynamics (Bloom Z4). The magnitude as well as the onset of the two sites bloom is different from each other and correlates with oceanic and meteorological conditions. The preceding winter time mixing plays an important role in the magnitude of blooms on a relative long-term scale, which is controlled by the frequency and intensity of cold air outbreaks (CAO). On the other hand, sea surface temperature, wind speed and direction have effects on a short-time scale. The ending of the Bloom Z11 is corresponding to the horizontal advection, whereas the Bloom Z4 is interrupted mainly by the wind forcing and will occur again if winds weaken. The study suggests the possibility that a much stronger and long time continued phytoplankton bloom can happens in the central Yellow Sea where hydrodynamic activities are minimal.