



Chlorophyll transported by mesoscale eddies in the Southeastern Tropical Indian Ocean

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The effect of eddies on the surface chlorophyll-a (CHL) offshore distribution in the Southeastern Tropical Indian Ocean (SETIO; 95°-115°E, 5°-20°S) was studied from 1997 to 2010. During this period, a high CHL extension was observed to be closely accompanied with strong eddy activities. Our results show that the high CHL is mainly associated with cyclonic eddies (CEs), which pump the subsurface nutrients to the upper ocean and trap and increase the amount of CHL inside the eddies. Moreover, to investigate the relationship between the eddy activity and CHL offshore extension in the SETIO region, we analyzed the mean CHL with the eddies detected from altimeter data, which showed that the amount of CHL inside CEs is significantly greater than the mean background value and the amount of CHL inside anticyclonic eddies (AEs) as well within 400 km offshore. This result indicates that the high CHL offshore extension in the SETIO could be sustained by the vertical nutrient pumping and horizontal advection of eddies. Furthermore, CHL showed significant seasonal variation in the SETIO. The nearshore CHL seasonal variation is controlled by the Asian-Australia monsoon, whereas the offshore CHL seasonal variation is significantly enhanced by eddy activity.