



Countercurrent Analyses near Southeast Coast of Taiwan

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The Kuroshio is part of the subtropical gyre of the North Pacific Ocean and is a strong and steady current that flows from south to north along east of Taiwan. Green Island is located off southeastern Taiwan. A submarine ridge located between the island and Taiwan. Due to shallow water, it will impact the Kuroshio Current to produce higher flow rate and probably countercurrents along the coast of eastern Taiwan. In this study, we used the current velocity from the HYCOM Ocean Model to analyze the probability of the countercurrent in the southeast coast of Taiwan from 1993 to 2014. The spatial resolution of the current data is 0.08° . An empirical orthogonal function (EOF) is applied to perform the analysis. The results show that the first EOF mode (EOF1) accounts for 83.76% of the total variance which displays a year round northward Kuroshio. The second EOF mode (EOF2) with 5.72% of the total variance indicates an east-west direction of current vector. It flows to the coast of Taiwan in winters and to the Pacific Ocean in summers. This is probably caused by the westward propagating mesoscale eddies from western Pacific Ocean. The third EOF mode (EOF3) accounts for 4.20% of the total variance which shows the countercurrents along the southeast coast of Taiwan. The spatial pattern shows the countercurrent probably related to the sea topography around Green Island. From the principal component of EOF3, the occurrence of the countercurrent does not have a specific period.