



Effective depth of warm eddy in the east of Taiwan

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Taiwan is located in East Asia and is situated southwest of Japan and north of the Philippines. The Kuroshio Current, a western boundary current of North Pacific, flows northward along the coast of east Taiwan to south Japan. The westward propagating mesoscale eddies originated by the instability of subtropical countercurrent (STCC) intrude into the Kuroshio region and generate an ocean eddy rich zone east of Taiwan. Ocean eddies can be detected and identified by sea level anomaly data derived from satellite altimetry. It is of interest to probe the correlation between sea level anomaly and characteristics of eddy below the sea surface. The objective of this study is to investigate the effective depth of mesoscale eddy close to the Kuroshio Current east of Taiwan by integrating remote sensing data and in-situ measurements. The data used in this study include sea level anomaly derived from satellite altimetry and temperature-salinity profile from ocean glider and Conductivity Temperature Depth (CTD) data during 1994–2015. To define the position of an oceanic eddy, an objective detection using the Okubo-Weiss algorithm is applied to the sea level anomaly data. The results show that an average of effective depth is 191.4 m of warm eddies and the sea level anomaly of eddy center is strongly related to the effective depth with a correlation coefficient of 0.85 (two-tailed p value is 0.016).