

A temperature description of vortex street around the Green Island off the eastern coast of Taiwan

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For providing essential information for Kuroshio current passing Green Island off the eastern coast of Taiwan, a three-dimensional general circulation model (MITgcm) is used to study the vortex street issue. Real topography derived from the Ministry of Science and Technology Ocean Data Bank and some Hycom hydrographic data are imposed for the model. In the light of different conditions, such as changing the magnitude of the Kuroshio fluxes in summer and winter, two interesting features are worth noting. The model results show that the mixing-layer effects on the vortex streets are more closely associated with the strength of the vortex street upwelling. In the summer case, a low-temperature water mass is usually generated behind the Green-Island when the Kuroshio Current impacts on it. The temperature drop degree resulted from the upwelling water in the wake is over 1°C, which is similar to the von Kármán vortex street. However, the temperature drop degree is moderate when the initial temperature of the model is changed to the winter conditions. While the model boundary fluxes are increased, the temperature drop region is expanded. On the other hand, the low-temperature region is narrowed when the boundary fluxes are reduced.

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