

Analyzing Variations of the Kuroshio east of Taiwan using Satellite Altimetry and Hydrographical and Tide gauge data

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Kuroshio is one of the major currents in the world and plays an important role in the North Pacific climate system due to the sea water, heat and salinity transport and complex air-sea interaction, which is also strongly related to local climate stabilization and natural hazard. In recent years, the velocity of Kuroshio Current increases, attributing to the changes in wind stress over the North Pacific under global warming and affecting sea level along the eastern coast of Taiwan and northward heat transport. Therefore, monitoring of the Kuroshio is of scientific and practical importance. In the study, we focus on the use of contemporary multi-mission satellite radar altimetry and *in-situ* MBT/XBT/Argo to calculate the surface and subsurface (0-2000 m) geostrophic velocities and the transport of the Kuroshio east of Taiwan based on the geostrophic balance equation. In addition, we will also analyze interannual and seasonal variations of the Kuroshio transport east of Taiwan using long-term tide gauge data. The estimated current velocities are validated using *in situ* mooring drifters or Argo drift trajectories, and used to study the evolution of the Kuroshio east of Taiwan and the correlation with climate indices, such as the Multivariate ENSO Index (MEI) and the Pacific Decadal Oscillation (PDO) index.

Keywords: Kuroshio Current, Satellite Altimetry , Tide gauge