

Sources of countercurrent in northeastern Taiwan

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A current along the coast of northeastern Taiwan has been reported by previous studies. Because it flows direction opposite to that of the Kuroshio, it is called a countercurrent. To know sources of the countercurrent, sea surface temperature data from Himawari-8, wind field data from WindSat, flow field data from The Copernicus Marine Environment Monitoring Service (CMEMS), outputs of the hybrid coordinate ocean model (HYCOM), cruise observations, and drifter data were analyzed. The field measurements by ship-board Acoustic Doppler Current Profiler (ADCP) during the cruise R/V Ocean Researcher II on November 13, 2019 showed that the countercurrent has an average speed of 0.18 m/s (ranges from 0.11 m/s to 0.25 m/s). This speed is consistent with the observation of drifters which originate from the Taiwan Strait Current. Satellite wind observations suggested that the countercurrent is forced by the summer monsoon from the Taiwan Strait. Satellite observations and model outputs also suggested that the cold dome near the northeast of Taiwan might be the other source of the countercurrent.

Keywords: Taiwan Strait Current, Kuroshio, Monsoon , Cold dome, Himawari-8, Drifter