

Distribution of the water masses on the East China Sea shelf slope ~Quick bulletin of observatoins in 2021-2022~

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Various oceanographic phenomena in the East China Sea (ECS) such as the Kuroshio current, tidal current, and turbulence, are not only intriguing from the oceanographic viewpoint, but also noteworthy for hydrography when considering the generation processes of bathymetric and geological structures related to the transport processes of the suspended solids. In this study, we promptly report the trial analysis of temperature, salinity and current velocity data observed at the slope using Expendable Conductivity Temperature Depth Profiler (XCTD) and Acoustic Doppler Current Profiler (ADCP) equipped on the bottom of our survey vessels.

Firstly, the data observed by the Japan Coast Guard(JCG)'s S/V *HEIYO* on August 3, 2021 show the presence of different water masses at the slope; the Kuroshio water mass and the shelf water mass. We conducted cluster analysis, which is a classical technique to classify water masses, to compare the distributions of potential temperature, salinity and current velocity of our observation data. Our results show lateral intrusion of less saline water to the Kuroshio at water depth of 60-80 m, and the intrusion of Kuroshio onto the bottom of the shelf, suggesting that the mixing of these water masses is occurring in this area. Manda et al. (2001) suggests that double diffusive convections can occur at the boundary of the two masses. Therefore, we calculated the Turner angle, which is utilized as an index of double diffusive convection activity. Our calculation shows that the Turner angle of about 75-85 degree tends to distribute near the lateral intrusion of less saline water. This indicates that salt fingers could potentially occur in this area. Secondly, the data from reciprocating observations for more than 10 hours by JCG' s S/V *KOYO* in 2022 show temporal variations of potential temperature, salinity and potential density for several hours at a water depth of 50m. Specifically, the data of October, when the surface mixing layer was ranging to a water depth of 80m, show a vertically uniform temporal variation of salinity. Due to the limitation of ship time, we cannot determine whether these variations are periodic oscillations or temporary variations. However, the data also show that these temporal variations of potential temperature, salinity and potential density approximately correspond to the variation of the meridional velocity.

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