



Numerical analysis on the Ulleung warm eddy in the East/Japan Sea

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Ulleung eddy in the East Sea is known as the Intrathermocline Eddy (ITE) located within the thermocline, which vertically stirs the stratified water column. The vertical mixing caused by the ITE plays an important role in the biochemical marine environment because the upper layer of seawater is supplied to the intermediate or deep layer of the East Sea and transports nutrients that could affect primary productivity there. Although the variation and movement of the eddies play a vital role in the marine environments, the dominant forcing on the Ulleung eddy, which is maintained continuously for several months, has not been known clearly. Thus, the numerical experiment was conducted to simulate what kind of kinetic energy keeps the eddy for months. The three-dimensional velocity fields simulated by the model were used to calculate vorticity terms of the governing equation. And those terms were analyzed for how it could affect to form and destroy the eddy. Also, we analyzed the relationship between the Ulleung eddy variability and the various marine physical components, such as advection of the stratified seasonal variations of temperature and salinity through the Tsushima Strait and restratification of the upper water column due to seasonal heating and cooling.