

Temporal and spatial variation of the mesoscale cold core eddy in the East China Sea

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Abstract: The East China Sea is important not only as a good fishing ground but also nursery and spawning area for many kinds of fishes. The East China Sea is characterized by three distinct water masses from NOAA satellite remote sensing. Those are the Kuroshio and a branch (the Tsushima Warm Current), which flows along the eastern boundary of the seas, a cold water mass originating from the northern Yellow Sea and the northern Chinese coasts, and a warm monsoon current from the South China Sea.

During the winter, cold air moves from Asiatic continent over the East China Sea, the overall cooling of surface water and the following convection allows an equalization of the temperature of sea water from the surface to bottom. However, when the winds blow from the southeast at an intensity comparable to that in the winter period, a warm monsoon current which originates from the South China Sea flows into the East China. As a result of the warm Kuroshio and Tsushima Currents which are also stronger when the winds blow from southeast, temperatures are considerably higher around the extended cold water from the coast of the East China.

At that time, the cold water was captured by warm water from the Kuroshio and Tsushima currents. Therefore, mesoscale cold core eddies formed in diameter of 150km had occurred in the East China Sea in May, 1999 and February, 2003.

The mechanism of eddy formation was studied by each condition, including boundary condition between the East China coastal cold water and the Kuroshio warm current, wind data related to the monsoon which was measured QuikSCAT, and the bottom topography of the East China Sea.