Event Detection and Visualization of Ocean Eddies based on SSH and Velocity Field

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Numerical studies of ocean eddies have been progressed using high-resolution ocean general circulation models. In order to understand ocean eddies from simulation results with large amount of information volume, it is necessary to visualize not only distribution of eddies of each time step, but also events or phenomena of eddies. However, previous methods cannot precisely detect eddies, especially, during the events such as eddies' amalgamation, bifurcation.

In the present study, we propose a new approach of eddy's detection, tracking and event visualization based on sea surface height (SSH) and velocity field. The proposed method detects eddies region as well as streams and currents region, and classifies detected eddies into several types. By tracking the time-varying change of classified eddies, it is possible to detect not only eddies event such as amalgamation and bifurcation but also the interaction between eddy and ocean current. As a result of visualizing detected eddies and events, we succeeded in creating the movie which enables us to intuitively understand the region of interest.