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Visualization for Oceanic General Circulation Model via Multivariate Analysis

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Visualization of numerical simulation data is necessary to understand intuitively natural phenomena or structures. However, it is difficult to extract informative data from large scale datasets that is output from large scale high resolution simulation on the massively parallel supercomputer.

We, then, research the feature extraction method and generation method of transfer function to obtain effective visualization results from high-resolution numerical simulation. In this work, the feature extraction methods from the ocean general circulation model (OFES) data and the visualization methods which emphasis the feature are development. The features such as ocean currents, vortices or water masses are extracted by using a multivariate analysis which clustering from temperature, salinity, fluid velocity and etc. Good visualization results with emphasis features can be made by using these extracted features.

In this presentation, we will report the application examples to visualize the currents of the Kuroshio / Kuroshio Extension region and the water mass of the thermohaline circulation.

Keywords: OGCM, visualization, multivariate analysis, cluster analysis, transfer function