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Multivariate Analysis for Visualization of Oceanic Global Circulation Simulation

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Visualization of numerical simulation data is necessary to understand intuitively natural phenomena or structures. Effective setting of transfer function (which maps the data value to color or opacity) is essential to producing an informative picture or movie. However, setting a good transfer function by trial and errors or craftsmanship is not an efficient way to handle large scale dataset.

We, then, research the generation method of transfer function to obtain effective visualization results. In this work, the feature extraction methods from the ocean global circulation simulation (OFES) data and the visualization methods which emphasis the feature are development. The features such as ocean currents, water mass or vortices 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 meridional overturning circulation.

Keywords: visualization, multivariate analysis, transfer function, oceanic global circulation simulation