



## **Delving three-dimensional structure of mesoscale eddies in the Northern South China Sea from seismic reflection transects**

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The seismic oceanography technique, a new option to oceanographers, is capable of capturing oceanic fine scale structures of oceanic mesoscale eddies. Mesoscale eddy has significant influence on the ocean thermodynamics and dynamics, biology, and military and civil activities, and is always the hot focus in oceanography. Most of the former eddy studies are focused on the sea surface and little is known about the vertical structures of eddies. Unraveling the three-dimensional structure of mesoscale eddies has been limited by the lack of observations and the complex dynamics of the system. Using an abundance of seismic data, satellite altimeter data and an automated eddy detection scheme, three-dimensional structure of mesoscale eddies during its propagation and evolution are examined in the Northern South China Sea (NSCS). During seismic data processing, after seismic prestack time migration, high-density bispectral analysis method in geovation seismic data process system is applied. The results show that high-density bispectral analysis method could achieve a speed-by-point analysis and solve the effect of anisotropy at far offset in the vertical inhomogeneous media, and the image quality of final PSTM profile is effectively improved. The possible outcome of this study would advance our understanding of the interaction between the flow and mesoscale eddy.