Internal Waves in the East Sea

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Abstract

Oceanic internal waves are important phenomena that provide a mechanism to move kinetic (tidal) energy into the shorter wavelengths of the wave spectrum. The shoaling and breaking of internal waves are also important to biological life systems, providing nutrient mixing and sediment transport. SAR (Synthetic Aperture Radar) images are often used to improve our understanding of the generation and the evolution of internal waves because they can cover such a large area of the oceans surface, several hundreds of kilometers on the side. More than 140 SAR images including ERS−1/2 quick look images, RADARSAT and ENVISAT ASAR images mostly acquired over the western part of East Sea, were analyzed to obtain typical scales, spatial and temporal distribution of short−period internal waves. On the other hand, long−period (near−inertial) internal waves have been often recorded from moored current measurements and water temperature sensors in the East Sea. However, the spatial characteristics of near−inertial internal waves had not been investigated until now, mainly due to lack of measurements. In this study, it is also demonstrated that the near−inertial internal waves could be effectively observed from SAR images. Using both two successive ENVISAT ASAR images and in−situ measurement data, the progress of near−inertial internal waves was also interpreted.