

## Mixing over the eastern ridge in the Luzon Strait caused by high-mode internal waves

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The Luzon Strait has two parallel ridges running from north to south, which is known to create large amplitude internal tides. To investigate the mixing processes accompanied by the internal tides, we carried out repeated observations with XBT, XCTD, CTD, and ADCP in the cruise of R/V Hakuho-maru KH-17-5, Leg-2, in November 2017 as part of the OMIX project. We obtained 6 cross sections around the eastern ridge between 121° 30' E and 122° 10' E along the line of 21° N.

The cross sections showed wavy structures of isopycnals over the ridge, with 4-7 km of horizontal scale and about 50 m of vertical scale. Velocity distributions by the shipboard ADCP showed strong vertical shear over the ridge, suggesting high-mode internal waves. Froude number of the high-mode internal waves exceeds unity around two summits of the ridge during the periods of strong tidal flow. This suggests that the high-mode internal waves stay over the ridge.

Many temperature inversions, especially large inversions ( $\theta > 0.05$  °C) were formed near the ridge (figure). Therefore, energy dissipation rate and vertical diffusivity assuming the model of Osborn (1980) were estimated by calculating Thorpe scale from the temperature profiles. Relatively large energy dissipation rate and vertical diffusivity were distributed over the ridge from surface to the bottom, as well as unstable regions of  $Ri < 0.25$ . These results reflect strong mixing over the ridge due to the high-mode internal waves.

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