## Flow intensification by the superposition of near-inertial internal waves in the abyssal Yamato and Tsushima Basins of the Japan Sea

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Near-inertial internal waves (NIWs) in the abyssal Yamato and Tsushima Basins of the Japan Sea were investigated using data from a moored acoustic Doppler current profiler (ADCP) and single-point current meters. The NIW events with duration of 3–5 days were observed intermittently in both basins. In particular, an active NIW event occurred below 2475 m in the Yamato Basin during May 12–16, 2014. This was followed by the upward propagation of a wave packet from 2475 to 950 m at speeds ranging 0.75–1.39 cm s<sup>-1</sup>. The near-inertial flows (1.07f) during the event exhibited a vertically coherent phase, although their amplitude increased with depth by a factor of 1.5 from 2475 to 2635 m. Similar near-inertial flows with vertical coherency and intensification with depth were observed in the Tsushima Basin in May 2015, suggesting that this is a general oceanic phenomenon. To explain the observed flow characteristics, the superposition of downward-propagating NIWs that can be excited by a strong wind event and upward-propagating NIWs that bounced off the seabed was examined. The time series of the Richardson number showed sporadic unstable conditions during the initial stage of the NIW event. In addition, relatively small values of Richardson number were observed over the range of 2475–2635 m during the period of active NIWs. This suggests the promotion of vertical mixing in the deep sea during significant NIW events.

Keywords: deep sea, mooring observations, near-inertial variation, bottom intensifed flows, Japan Sea, standing waves