

EGU21-3925, updated on 18 Oct 2021

<https://doi.org/10.5194/egusphere-egu21-3925>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Observations of nonlinear internal waves of tidal origin in the northeastern East China Sea

Seung-Woo Lee and SungHyun Nam

Seoul National University, College of Natural Sciences, School of Earth and Environmental Sciences, Korea, Republic of
(lsw.ocean@gmail.com)

Oceanic nonlinear internal waves (NLIWs) play an important role in regional circulation, biogeochemistry, energetics, vertical mixing, underwater acoustics, marine engineering, and submarine navigation, most commonly generated by the interaction between barotropic tides and bathymetry. Here, we present characteristics of first mode NLIWs observed using high-resolution in-situ data collected using moored and underway temperature sensors in a relatively flat bottom in the northeastern East China Sea during May 15-28, 2015. During the experiment, totally 34 events of first mode NLIWs were identified and characterized with amplitude of 4–16 m, characteristic width of 310–610 m, propagation speed of 0.53–0.56 m s⁻¹, and propagation direction (mainly southwestward propagation), respectively. Most NLIWs were observed during period of spring tide with phases locked to semidiurnal barotropic tides. Generation and propagation of the first mode NLIWs observed in the region are discussed in relation to satellite images and historical hydrographic data collected in the region. Our results support significance of first mode NLIWs and their interactions on turbulent mixing and regional circulation particularly in a broad and shallow continental shelves where the NLIWs generated from multiple sources propagate into multi-directions experiencing wave-wave interactions.