

Generation and Propagation of Nonlinear Internal Waves in the Southern Andaman Sea Derived from Synthetic Aperture Radar Images

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Over 60 Synthetic Aperture Radar (SAR) thumbnail images from May to August of 2003 to 2011 are projected onto the Southern Andaman Sea (SAS). At least 40 packets of nonlinear internal waves (NLIWs) are identified, pointing to a likely candidate source near the ridge between the Nicobar Islands and the Northern Sumatra. The NLIWs are generated mostly around the time of spring tides at the source. Afterwards, the NLIWs rapidly evolve into packets near the source region, indicating a generation mechanism of lee wave evolving rather than internal tide steepening. These packets are able to propagate eastward for over 300km at a mean speed of about 2.2m/s. The wave crests are almost confined into a circular sector originating from the source within a radius of about 300km, and the leading one nearly coincides with the sector arc, suggesting a horizontally uniform propagation speed of the NLIWs packets across the SAS. These results present a clear picture of the generation and propagation of NLIWs in the SAS by their surface signatures but underscore the need to conduct in situ investigations in the future.