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Nonlinear Internal Waves in the Sulu Sea

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Large-scale internal waves are very active in the Sulu Sea, South of the Philippines. In this paper, we have collected more than 400 of ERS-1/2 SAR images, obtained during 1996 and 2001, from web site of the Centre for Remote Imaging, Sensing and Processing (CRISP), http://crisp.nus.edu.sg. First, we plotted the distribution map of the internal waves in the Sulu Sea. From this map, we study the generation, propagation and evolution of internal waves in the Sulu Sea. We found similar results as studied in Apel et al. (1985) and Liu et al.(1985). It is found that most of the internal waves are generated from the Sulu archipelago in southeast of the Sulu Sea and travels toward the Palawan Island. But, now SAR images provide us much more details in generation processes. SAR images indicated that there are at least three wave generation sources. Wave fronts from each neighboring source will interact with each other and then be connected as a long wave crest with length of 100 km near the sources. This 2D effect of "hand-in-hand" phenomenon is essential for the formation of huge internal solitons in the Sulu Sea. The SAR images also show us some other features/processes, such as no internal waves in the North East of the Sulu Sea, and the refraction and diffraction of internal waves in the shallow water South West of the Sulu Sea.

Keywords : Internal Wave; SAR; Sulu Sea

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