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OCEAN WAVE ENERGY ESTIMATION USING ACTIVE SATELLITE IMAGERY AS A SOLUTION OF ENERGY SCARCE IN INDONESIA CASE STUDY: POTERAN ISLAND'S WATER, MADURA

Z. A. Nadzir, L. A. Karondia, L. M. Jaelani, A. Sulaiman, A. Pamungkas, E. S. Koenhardono, and A. Sulisetyono
Dept. of Geomatics Engineering, Faculty of Civil Engineering and Planning, Institut Teknologi Sepuluh Nopember, Surabaya, 60111, Indonesia
Dept. of Urban and Regional Planning, Faculty of Civil Engineering and Planning, Institut Teknologi Sepuluh Nopember, Surabaya, 60111, Indonesia
Dept. of Marine Engineering, Faculty of Marine Technology, Institut Teknologi Sepuluh Nopember, Surabaya, 60111, Indonesia
Dept. of Naval Architecture and Shipbuilding Engineering, Faculty of Marine Technology, Institut Teknologi Sepuluh Nopember, Surabaya, 60111, Indonesia
Pusat Teknologi dan Inventarisasi Sumber Daya Alam (PTISDA), Badan Pengkajian dan Penerapan Teknologi (BPPT), 8th MH Thamrin Street, Jakarta, 10340 Indonesia

Abstract. Ocean wave energy is one of the ORE (Ocean Renewable Energies) sources, which potential, in which this energy has several advantages over fossil energy and being one of the most researched energy in developed countries nowadays. One of the efforts for mapping ORE potential is by computing energy potential generated from ocean wave, symbolized by Watt per area unit using various methods of observation. SAR (Synthetic Aperture Radar) is one of the hyped and most developed Remote Sensing method used to monitor and map the ocean wave energy potential effectively and fast. SAR imagery processing can be accomplished not only in remote sensing data applications, but using Matrices processing application as well such as MATLAB that utilizing Fast Fourier Transform and Band-Pass Filtering methods undergoing Pre-Processing stage. In this research, the processing and energy estimation from ALOSPALSAR satellite imagery acquired on the 5/12/2009 was accomplished using 2 methods (i.e Magnitude and Wavelength). This resulted in 9 potential locations of ocean wave energy between 0-228 W/m2, and 7 potential locations with ranged value between 182-1317 W/m2. After getting through buffering process with value of 2 km (to facilitate the construction of power plant installation), 9 sites of location were estimated to be the most potential location of ocean wave energy generation in the ocean with average depth of 8.058 m and annual wind speed of 6.553 knot.

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