

EVALUATION OF WIND-WAVE GENERATION FORMULATIONS FOR SEPARATING WIND SEA AND SWELL AT THE GULF OF TEHUANTEPEC

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Measurements of atmospheric and oceanographic parameters have been taken by the CICESE from an offshore location at the Gulf of Tehuantepec. The relevant features in the area are its particular meteorological and wave conditions. Due to a geographical depression of the mountain chain that goes along the isthmus a wind system 'Tehuanos' is formed. This wind system forces a sea that travels southwards offshore, where the wave climate is to a great extent dominated by the presence of swells that propagate typically northwards to the coast. Different methods for separating wind sea and swell have been tested. Namely (a) a constant split up frequency, (b) Drennan *et al.*, formulation, (c) Komen *et al.* formulation, (d) Janssen's theory which is the wind-wave generation mechanism of the WAM model, and (e) spectral partitioning in combination with (c). A constant split up frequency appears to be accurate in this case given that swell and wind sea systems are very well defined in the frequency domain. The use of spectral partitioning has also output satisfactory results. Inconsistencies due to the artificial splitting of the spectrum were found for methods (b), (c) and (d), for which the actual energy of the wind sea is not properly estimated. There was no substantial difference found on the energy-frequency evolution of wind seas for Tehuanos and non-Tehuanos winds.

References

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