Geophysical Research Abstracts
Vol. 14, EGU2012-11947, 2012
EGU General Assembly 2012

Detailed studies on the effect of combined wind-sea and opposing swell on the ocean-atmosphere fluxes

F. J. Ocampo-Torres (1), P. Osuna (1), H. García-Nava (2), B. R. Furevik (3), and H. Branger (4)

(1) CICESE, Physical Oceanography, Ensenada, Mexico (ocampo@cicese.mx, +52 646 1750568), (2) UABC, IIO, Ensenada, Mexico, (3) Meteorologisk Institutt, Bergen, Norway (birgitte.furevik@met.no), (4) IRPHE, U. Marseille, Marseille, France (branger@irphe.univ-mrs.fr)

Following a 2005 field campaign to study the possible influence of swell on wind-sea development and on air-sea momentum fluxes, it has been demonstrated some reduction of the wind stress due to the presence of long swell in the opposite direction, in particular during moderate to strong winds. Further field measurements, numerical simulation and laboratory experiments are to be carried out with the objective of describing in detail the effect of swell in the opposite wind direction on the ocean-atmosphere fluxes. These research activities are being built upon the framework of RugDiSMar, a CONACYT (Mexican Research Council) project to determine the control effect that the sea surface structure and its dynamics imposes on the air-sea interaction processes. The measurements being proposed will be aimed to obtain information in a wider range of swell steepness in a very characteristic ocean region where strong off-shore wind develop while swell arrives in the opposite direction. We are focusing the detailed measurements to reach a better description of wave directionality. Furthermore, we aim to describe numerically the wave growth in short fetches and to study the effect of rapidly accelerating and decelerating wind on the air-sea fluxes. We propose at least two field campaigns, one in winter when moderate to strong winds are more frequent (Tehuano events) and another one associated with the genesis and evolution of tropical storms. Detailed numerical simulation will serve as an advanced tool to elucidate on the wave growth under short fetches. Laboratory experiments will allow us to determine the effect of rapidly accelerating-decelerating winds on the momentum transfer and eventually the wave growth. Full description of the measurements to be carried out and instrumentation to be used will be presented. Further details on advance numerical simulation and laboratory experiments will also be addressed. This is a contribution of RugDiSmar project, CONACYT-155793.