EGU22-10814
https://doi.org/10.5194/egusphere-egu22-10814
EGU General Assembly 2022

Ocean surface wave and turbulence characteristics from direct measurements with a velocity sensor deployed in a buoy

Francisco J. Ocampo-Torres[1], Pedro Osuna[2], Bernardo Esquivel-Trava[3], Nicolas Rascle[4], and Héctor García-Nava[5]

[1]CICESE, Physical Oceanography, Ensenada, Mexico (ocampo@cicese.mx)
[2]CICESE, Physical Oceanography, Ensenada, Mexico (osunac@cicese.mx)
[3]CICESE, Physical Oceanography, Ensenada, Mexico (esquivel@cicese.mx)
[4]CICESE, Physical Oceanography, Ensenada, Mexico (nrascle@cicese.mx)
[5]UABC, Instituto de Investigaciones Oceanológicas (hector.gnava@uabc.edu.mx)

There is great interest in acquiring directional ocean surface wave direct measurements in order to better determine sea state conditions in open waters as well as in harbors and nearshore sites. Typical applications range widely over coastal and oceanic engineering, naval architecture and safety at sea, for design and construction of vessels and infrastructure, as well as for maintenance and marine operations. In this work we explore the influence of the buoy motion and we are able to detect some turbulence characteristics of the near surface flow. Full motion of the buoy structure is recorded by an Inertial Motion Unit within the velocimeter case, and after applying motion corrections directional wave and some turbulence characteristics are analyzed. The buoy responde is readily defined and the final results are compared with corresponding measurements from a bottom fixed acoustic Doppler current profiler. Details of the groupinness behaviour of the wave field in a nearshore site are given, showing some enhancement of turbulence intensity during the passage of relatively high wave groups. Some attempts to quantify the kinetic energy dissipation rate are explained. Final results show similar turbulence intensity values from the buoys measurements when compared with those from the fixed ADCP.