Geophysical Research Abstracts
Vol. 19, EGU2017-9773, 2017
EGU General Assembly 2017

Assessing sea wave and spray effects on Marine Boundary Layer structure

Christos Stathopoulos (1), George Galanis (1,2), Platon Patlakas (1), and George Kallos (1)

(1) National & Kapodistrian University of Athens, Department of Physics, Athens, Greece (kallos@mg.uoa.gr), (2) Naval Academy of Greece, Section of Mathematics, Chatzikyriakion, Piraeus 18539, Greece

Air sea interface is characterized by several mechanical and thermodynamical processes. Heat, moisture and momentum exchanges increase the complexity in modeling the atmospheric-ocean system. Near surface atmospheric levels are subject to sea surface roughness and sea spray. Sea spray fluxes can affect atmospheric stability and induce microphysical processes such as sea salt particle formation and condensation/evaporation of water in the boundary layer. Moreover, presence of sea spray can alter stratification over the ocean surface with further insertion of water vapor. This can lead to modified stability conditions and to wind profiles that deviate significantly from the logarithmic approximation. To model these effects, we introduce a fully coupled system consisting of the mesoscale atmospheric model RAMS/ICLAMS and the wave model WAM. The system encompasses schemes for ocean surface roughness, sea salt aerosols and droplet thermodynamic processes and handles sea salt as predictive quantity. Numerical experiments using the developed atmospheric-ocean system are performed over the Atlantic and Mediterranean shoreline. Emphasis is given to the quantification of the improvement obtained in the description of the marine boundary layer, particularly in its lower part as well as in wave characteristics.