



Investigating the effect of wave-induced mixing for hurricane conditions with coupled ocean-atmosphere-wave model

Changlong Guan

Ocean University of China, Physical Oceanography Laboratory, Qingdao, China (clguan@ouc.edu.cn)

At the present, it is the significant issue to use the coupled ocean-atmosphere-wave model to study the air-sea interaction at the sea state with the high wind speed and huge wave conditions. The coupled ocean-atmosphere-wave model—the COAWST model, is modified by including the parameterization scheme of wave-induced mixing. The response of ocean to hurricane forcing has been investigated with the modified coupled model for idealized and real hurricane cases. It is shown that the effect of wave-induced mixing on the sea surface temperature, the mixed layer depth, turbulence kinetic energy, vertical viscosity coefficient, temperature vertical diffusion coefficient, is dependent on the location with respect to the center of the hurricane, for instance the region of the hurricane "cold suction" or the hurricane "heat pump" area. The inclusion of wave-induced mixing in the COAWST model makes the model involved with more physics to simulate the response of ocean to hurricane.