



Effect analysis of drag coefficient using KIM-Wave Watch 3(WW3) coupled system

Inchae Na, Junghan Kim, and Inhyuk Kwon

KIAPS, Data Assimilation Team, Korea, Republic Of (advance9852@naver.com)

Tropical cyclones with strong wind and tsunamis severe disaster in the coastal and inland regions every year. Extensive research has been focused on air-sea interactions for prediction of tropical cyclones. The drag coefficient which indicates atmosphere-ocean momentum exchange, was based on extrapolation measured in strong winds and few observed cases. Recently there are many studies on the parameterization of sea surface roughness through the drag coefficients, focusing on various observation data and numerical models such as aircraft and buoys. Moon et al.(2004a) investigated the correlation of the charnock coefficient on the wave age at high winds using a numerical model. Peng and Li(2015) establish a parabolic model of drag coefficient based on storm surge observations and simulation in the South China Sea (SCS) through a number of tropical cyclone cases. WW3 version 5.16 updated the physical packages switch by French Research Institute for Exploitation of the Sea (IFREMER) and National Centers for Environmental Prediction (NCEP). In this study, I would like to analyze the sea surface roughness through the coupling of KIM(Korean Integrated Model) and WW3(WaveWatch3) by applying five drag coefficients. Sea surface roughness affects central pressure and moving speed of tropical cyclone. Overestimated sea surface roughness decreases wind speed and circulation of the pressure. On the other hand small surface roughness enhances the wind speed and the circulation of the atmospheric pressure. The equation of Peng and Li(2015) among five drag coefficient showed the best performance. Peng and Li(2015) equation indicated the pressure-wind relationship which is the best to observation and decreased RMSD for wind forecast.