Received: July, 15. 2015, Accepted: September, 14. 2015

Abstract

The air-sea CO_2 gas transfer velocity is generally expressed as a function only of the wind speed U_{10}. However, there exists considerable disagreement among the observed values. The disagreement is especially large in the context of the different sea surface conditions (wind wave growth and swell etc.). Consequently, many models of the air-sea CO_2 gas transfer velocity are proposed by field and laboratory experiments. In this study, we evaluate the estimated global air-sea CO_2 gas flux using the different some air-sea CO_2 gas transfer velocity models (field experiment model, laboratory experiment model and hybrid model considering wave breaking). The 6-hourly wind speed and mean period of wind and wave data sets by ECMWF were used. The maximum difference of annual global air-sea CO_2 gas flux was 0.76 PgC/year. The annual global air-sea CO_2 gas flux of each laboratory experiment models were the smallest value, and each hybrid models were near value to each field experiment models. The difference of each model in low latitude is large, same as the difference in middle latitude. This shows that the difference of the result of each model in low latitude is significant for the estimation of air-sea CO_2 gas flux.