



Variability of Sea Drag in Response to Meteorological and Wave Properties

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Drag coefficient is one of the most important properties used in modelling the air-sea interactions. Most of the dependences employ the sea drag as a function of mean wind speed. The scatter of experimental data around such parametric dependences, however, is very significant and has not improved noticeably over some 30 years. This scatter imposes a serious limitation on predictions that make use of sea surface-drag parameterisations.

Babanin and Makin (2008) suggested that, apart from the wind speed, the drag depends on a number of other physical properties and phenomena, whose effect on the sea drag should be investigated and incorporated in the final parameterisation in order to reduce the scatter. These properties include, among possible others, the directional spreading of the surface waves, gustiness of the wind, humidity of the air.

The aim of the present study is to investigate the drag coefficient as a function of these environmental properties by means of numerical modelling with WBLM (Wave Boundary Layer Model, Chalikov and Rainchik, 2010). 1-D equations derived by Chalikov and Rainchik are used here for extensive calculations of WBL structure in order to study the respective dependences and variability of the drag coefficient.

References

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