Geophysical Research Abstracts, Vol. 7, 00628, 2005 SRef-ID: 1607-7962/gra/EGU05-A-00628 © European Geosciences Union 2005



Possible evidence of nonlinear wind-wave interaction in field experiments

V. Bakhanov (1), I. Repina (2) and Yu. Troitskaya (1)

- 1. Institute of Applied Physics, Nizhny Novgorod, Russian Federation (yuliya@hydro.appl.sci-nnov.ru / Fax: +7 8312-365976 / Phone: +7 8312-368297)
- 2. Institute of Atmosphere Physics, Moscow, Russian Federation

The field investigation of surface waves and near water layer of atmosphere variability above a submarine mountain were carried out in the Theodosia Bay of the Black Sea. The bottom configuration was registered by echo-sounder. The parameters of surface waves were measured by X and Ka Doppler radar, two-dimensional optical spectro-analyser (DOSA) and linear array of CCD sensors. The parameters of nearwater wind were measured by the Acoustic digital anemometer-thermometer ADAT-3M and Acoustic thermometer USA-1 (METEK). The measurements reveal negative correlations of variations of the wind and wave fields. A possible mechanism explaining effect of variability of sea surface on the velocity field of near water wind is proposed basing on consideration of modulation of momentum exchange between waves and wind. A theoretical model is constructed taking into consideration nonlinear interaction between waves and atmospheric boundary layer in quasi-linear approximation/ Calculations in the framework of the model are in good quantitative agreement with the field experimental data.

This work was performed under financial support of the Russian Foundation for basic research (project codes 05-05-65974).