



## **Some regularities of the sediment suspension under waves with group structure**

Ruben Kosyan and Boris Divinsky

Shirshov Institute of oceanology, RAS, Coastal zone, Gelendzhik, Russian Federation (rkosyan@hotmail.com)

The ultimate purpose of sediment transport studies is the prediction of bottom relief in the zone of active wave effect accompanied by transport of significant sand volumes. The energetic longshore currents induced by the oblique wave approach, transport large amounts of sand lifted by waves from the sea bottom. This mass sediment transport and its longshore variations finally determine the shoreline configuration and the location of accumulative and erosion areas on the underwater slope. Modelling of the sediment transport is limited by the absence of clear physical mechanisms of sediment suspension.

Main objective of this work is to investigate the impact of the wave energy frequency distribution on the dynamics of sediment suspension and to study features of suspension during the passage of waves groups with varying shape and intensity

The study is based on experimental data in the Large Wave Channel of the Coastal Research Centre in Hannover, Germany. The features of the energy frequency distribution of synchronous oscillations of the water velocities and the suspended particles concentration are analyzed. An investigation of the features of sediment suspension during the passing of waves groups of different forms and intensity was also performed.

Main conclusions:

1. At the same integral characteristics of the irregular surface wave, specificity of wave action on the sandy bottom is especially determined by frequency distribution of wave energy.
2. The concentration of wave energy in the area of the main peak of the spectrum promotes the growth of the ripples linear dimensions and promotes more active injection of sediments in the upper layers.
3. With decreasing of the surface waves spectrum width the depth of the sediment erosion increases, contributing to the transition of more suspension.
4. Suspension of the bottom material under the influence of groups of waves is characterized by a combination of hydro and lithodynamic factors: the wave power, sequence of waves in the group, the length of the groups, the size and stability of relief forms. The initial process of engagement within the boundary layer occurs on the scale of single waves, redistribution in the water column - on the scale of wave groups.
5. We manage to pick out several characteristic types of instantaneous vertical distribution of suspension: "background", when sand suspension takes place only in the near bottom water layer, sand suspension in the whole water column and that one after the surface wave passing. The obtained information will help to improve the quality of analysis of experimental data.

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