Sukhinov A. I. (Rostov-on-Don, Russia), **Sidoryakina V. V.** (Taganrog, Russia), **Protsenko S. V.** (Rostov-on-Don, Russia). **Numerical investigation of stochastic model of suspension transport in coastal systems.**

This paper is devoted to the construction and numerical study of a suspension transport model [1-2] in the coastal zone of water bodies, taking into account the stochastic nature of wind waves, which are the main factor determining currents and, therefore, movement of bottom sediments and suspended matter in the coastal zone. This model was investigated for correctness, and the corresponding theorem on the existence and uniqueness of the solution was proved. The model takes into account many physically significant factors: diffusion and convection of suspensions, the effect of gravity on the suspension, the presence of the bottom and the free surface. The intensity of the processes associated with the transfer of suspension, is determined by the turbulent structure of the flow of the reservoir, the calculation of which makes it necessary to find the coefficient ν of the vertical turbulent exchange and its parametrization. For this purpose, the authors use algebraic subgrid models based on the definition of turbulent flows as space-averaged or time-averaged (correlation) products of deviations of the components of the velocity of currents and the transferred physical quantity. The vertical turbulence coefficient is based on data on instantaneous values and pulsations of three-dimensional velocity vectors as a function of depth in many dozens of points of the shallow water body of the Sea of Azov, obtained from the data of the expedition using the ADCP probe (Acoustic Doppler Current Profiler) WHS600 Sentinel. To calculate the turbulent exchange coefficient, numerical experiments were performed based on several vertical approaches for all points. To obtain the distribution of the vertical exchange coefficient, the approaches of A.S. Monina and OM Belotserkovsky. In particular, to find the distribution of the vertical exchange coefficient according to A.S. Monina in the coordinate system $Oxyz$ calculations were made according to the formula

$$\nu\,(z) \equiv \nu_{ZZ}(z) = \sqrt{\nu_{ZZx}(z)^2 + \nu_{ZZy}(z)^2}, \nu_{ZZx}(z) = -\overline{u'w'}/\frac{\partial \overline{u}(z)}{\partial z},$$

$$\nu_{ZZy}(z) = -\overline{v'w'}/\frac{\partial \overline{v}(z)}{\partial z},$$

where $u(t)$ is the instant speed, $\bar{u}(t)$ is the average speed, $u'(t)$ is the pulsation component, $\overline{u'w'}$, $\overline{v'w'}$ are the time-averaged correlations of the pulsations of the horizontal and vertical components of the velocity.

As the frequency of the wind waves, it is proposed to use its expectation, and in the case of the availability of experimental data on the probabilities of frequency distribution - the average sample value.

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