



The study of coastal ground surfaces to predict the ways of increasing efficiency of research mobile robots

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The increase in spatial scales of studying coastal areas can be achieved by the use of mobile robotic systems (MRS) equipped with scanning equipment, video inspection system and positioning system. The project aims at increasing the capabilities for designing effective ground MRS through the use of advanced methods of forecasting characteristics of vehicle-terrain interaction in coastal zones, where hydrosphere, lithosphere, atmosphere and biosphere interact.

In the period from 14 May to 18 June 2016 there was organized the expedition to Sakhalin Island for conducting full-scale testing autonomous MRS for coastal monitoring and forecasting marine natural disasters [Kurkin A.A., Zeziulin D.V., Makarov V.S., Zaitsev A.I., Belyaev A.M., Beresnev P.O., Belyakov V.V., Pelinovsky E.N., Tyugin D.Yu. Investigations of coastal areas of the Okhotsk sea using a ground mobile robot // Ecological systems and devices. 2016. No. 8. P. 11-17]. Within the framework of the expedition specific areas of terrain in the vicinity of Cape Svobodny were investigated (with the support of SRB AMR FEB RAS). Terrain areas were studied from the standpoint of possibility of the MRS movement. As a result of measuring all the necessary data on the physical-mechanical and geometric characteristics of the coastal zones, required to calculate the force factors acting on the MRS, and, accordingly, the parameters of its motion were received.

The obtained data will be used for developing new statistical models of the physical-mechanical and geometrical characteristics of the coastal ground surfaces, creating methodology for assessing the efficiency and finding ways to optimize the design of the MRS.