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RESEARCH OF THE USING POSSIBILITY AN UNMANNED SURFACE VEHICLE AS A CARRIER OF A HELICOPTER-TYPE UNMANNED AERIAL VEHICLE

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The use of unmanned aerial vehicles (UAV – helicopter-type quadcopters) based on a mobile marine platform in the form of an unmanned surface vehicle (USV) allows solving a number of new problems, both military and dual-use. One of the main issues accompanying such a technical solution is ensuring the retention of the UAV on the USV landing pad and the implementation of contactless transmission of electricity from the USV to the UAV to charge its batteries. There is no information in the available sources about any results in this area, therefore the problem of fixing the UAV on the USV with its battery charge is relevant with an unconditional prospect of practical application. To solve this problem, a USV landing pad was developed, equipped with a matrix of specially designed electromagnets. Switchable interaction between the matrix of electromagnets and the UAV landing elements made it possible to combine the functions of holding the UAV with contactless charging of its batteries in one device. The conducted studies made it possible to determine the requirements for the energy parameters of the holding electromagnets to ensure the UAV is fixed without displacement on the landing pad under given external influences in the form of a certain wind load, as well as roll and vibration. The developed methods of experimental research on a large-scale model of a landing pad with a UAV ensure the reliability of the results. The technical solutions underlying the implementation of the adopted method of basing a UAV on a USV are protected by patents of the Russian Federation. The results obtained will find practical application in patrolling, monitoring and reconnaissance, as well as in relaying signals in communication networks connecting surface ships, aircraft and unmanned aerial vehicles.

Keywords: quadcopter, unmanned surface vehicle, landing pad, matrix of electromagnets, quadcopter fixation, contactless battery charging.

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