

ON PARAMETRIC RELATION OF HYDRODYNAMICS AND MOTION STABILITY OF THE AUTONOMOUS UNDERWATER ROBOT

Kiseljov L.V., Medvedev A.V.

Institute of Marine Technology Problems FEB RAS
5a Sukhanov Str., Vladivostok, 690091. E-mail: imtp@marine.febras.ru

ABSTRACT

Estimation of the dynamic properties of the autonomous underwater vehicles (AUV) is the necessary design and test elements of the underwater vehicles of this class. This estimation depends on design and functional special AUV features and also on the mission's forms. Basic problem signifies the guarantee of the dynamic processes qualities with the functional and technical limitations. Experience of the theoretical and experimental researches in IMTP FEB RAS is used for the solution of this problem in the paper. The simulation model, which contains software "virtual hydrodynamics", is used for estimation of the dynamic properties AUV. Stabilization of motion with respect to the initial state of system, the control parameters and the variety of motion states has fundamental importance. The comparison of theoretical (modeling) results and data of real trajectory measurements is conducted for solution of these questions. The task consists of the estimation of the influence of design forms on the hydrodynamics AUV and the selection of the fundamental characteristics of the motion control system. In this work is researched AUV hydrodynamics, created in IMTP in recent years.

Key words: autonomous underwater vehicle, control system, hydrodynamic, dynamic processes

REFERENCES

1. Ageev M.D., Kasatkin B.A., Kiselev L.V., Molokov Yu.G., Nikiforov V.V., Rylov N.I. *Avtomaticheskie podvodnye apparaty* [Automatic underwater vehicles]. Leningrad: Sudostroenie, 1981, 223 p.
2. Ageev M.D., Kiselev L.V., Matvienko Yu.V. i dr. *Avtonomnye podvodnye roboty. Sistemy i tekhnologii* [Autonomous underwater robots. Systems and technologies]. Moscow: Nauka, 2005, 400 p.
3. Kiselev L.V., Inzartsev A.V., Medvedev A.V. *Podvodnye issledovaniya i robototekhnika - Underwater Investigations and Robotics*, 2006, no.2, pp. 13-26.
4. Kiselev L.V., Medvedev A.V. *Podvodnye issledovaniya i robototekhnika - Underwater Investigations and Robotics*, 2008, no. 1(5), pp. 16–23.
5. Kiselev L.V., Medvedev A.V. *Podvodnye issledovaniya i robototekhnika - Underwater Investigations and Robotics*, 2012, no. 1(13), pp. 24–35.