ntegrated orientation and navigation systems for marine vehicles/carriers (In Russian)

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The book deals with integrated orientation and navigation systems (IONS) which are the main source of information of automatic motion control systems of marine vehicles.
The purpose and the basic design of IONS are considered, the algorithms for the operation of strapdown inertial measurement units (SIMU) and receivers of spacecraft navigation systems (SNS) are given**.** The purpose and the problems solved by electronic chart display information systems (ECDIS) are described. The SIMU mathematical error models based on different types of gyroscopes and gyroless SIMU are presented, as well as IONS error models for alignment and calibration modes, autonomous and observation operational modes.
The state of the art in the development of the main modules of IONS, in particular, SIMU sensitive elements, receivers of SNS and ECDIS is reviewed. The present-day requirements are formulated and structure of IONS for ships and vessels of various classes is described.
The accuracy in generation of navigational and dynamic motion parameters of marine vehicles provided by IONS based on SIMU with electrostatic, laser and fiber-optic gyros, as well as gyroless SIMU with angular accelerometers is analysed. A mathematical model, analytical expressions for errors and the results of computational error modeling are given for each of IONS considered in the book.
The book is intended for engineers, technicians and researchers engaged in marine engineering, navigation and marine motion control problems. The book can be used by teachers, postgraduates and senior students of naval schools.
References: 79. Illustrations: 71.
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