**"Gyroskopiya i Navigatsiya" №1, 2007**

**CONTENTS**

|  |  |  |
| --- | --- | --- |
| **A.A. Fomichev, A.B. Kolchev, P.V. Larionov, R.V. Pugachev, V.B. Uspensky** | **Data integration in the integrated navigation system at incomplete satellites constellation** | **3** |
| Work of the integrated navigating system in conditions of supernumerary use of the information from navigating satellites is considered. The opportunity of vector condition correction is analyzed at use of the data only from 1-3 navigating satellites and system of air signals. In these conditions integrated data algorithms are stated. Computer modeling estimations of such algorithms efficiency in various conditions of use are received. | |  |

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| **L.B. Rapoport, M.Ya. Tkachenko, V.G. Mogilnitskiy, A.A. Khvalkov, A.V. Pesterev** | **GNSS / INS integrated system: experimental results and applications in mobile robots control** | **16** |
| Two systems are described in this paper. The first system is based on four dual-band GNSS (L1+L2 GPS/GLONASS) receiver boards. This system provides 3D attitude and RTK position, as well as the Doppler-based velocity. Another system consists of a single dual-band GNSS receiver and the INS block. The problem of the control of the wheeled mobile robot is also considered in the paper. The control goal is to force the target point of the robot to follow a certain trajectory by applying controls to the front wheels. The vehicle must find the desired path from an arbitrary initial position and orientation. Synthesis of a control algorithm based on the feedback linearization concept is presented in the paper. | |  |

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| **S.P. Dmitriev, M.B. Rosenhaus** | **Possibilities to specify reliability characteristics of navigation systems equipment elements with the use of field-collected data** | **29** |
| Reliability analysis for the elements of navigation systems is done according to the field failure data. The analysis is based on correlation of certified reliability characteristics with characteristics obtained with the usage of field-collected data. The estimation of mean time between failures and the probability of realized number of element failures, conditional to certified reliability value, are offered for the characteristics. The analysis allowed to reveal low-reliability types of elements. It also offers recommendations to eliminate similar situation. | |  |

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| **V.D. Dudka, V.I. Babichev, V.Ya. Filimonov, V.V. Kirilin, V.I. Gorin, V.Ya. Raspopov, D.í. Malyutin** | **Onboard gyro devices of the roll rotating airborne vehicles** | **36** |
| For the transformation of control orders from starting system of coordinates (SC) to system of coordinates concerned with aircraft (fig. 1) gyrodevices made by way of three-degree-of-freedom gyroscope with gimbal suspension which has an outer frame bracket axis parallel to aircraft longitudinal axis (fig. 2) are used on board of rolling aircrafts moving in flat trajectory. Such gyrodevices are called gyroscopic order pickups or gyrocoordinators (GC). Gyrocoordinator design depends on way of aircraft start placing (fig. 3, 4, 5). On board of aircraft moving in ballistic curve (fig. 6) the gyrocoordinators and directional gyros (DG) are installed. Gyrocoordinators are made by way of three-degree-of-freedom gyroscope with inner gimbal suspension that has principal axis parallel to aircraft longitudinal axis (fig. 7, 8, 9). In that case the gyrocoordinator models supporting plane, the control orders are formed relative to the supporting plane. To generate the aircraft weight compensation control orders the directional gyro (fig. 10, 11, 13) that has design kinematically similar to the gyrocoordinator design is used. Appearance of phase error (fig. 12) which depends on device drifts is typical of gyrocoordinators and directional gyros made by way of gyroscope having principal axis parallel to aircraft longitudinal axis. | |  |

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| **V.M. Slyusar** | **On effect of instrumental factors on strapdown attitude drift rate** | **47** |
| This paper deals with the problems of attitude drift rate rectified in a vibrational environment due to strapdown system instrumental factors. More specifically, the paper provides an overview of attitude error models associated with the inherent characteristics of the IMU mechanization, and discusses some possible approaches that can be used to minimize (or compensate) the effect of hardware dependent factors on system performance in the presence of angular vibration .The following contributors to the rectification errors that only appear at the system level are considered and treated within the scope of this report: (1) angular rate sensor triad pulse quantization effect; (2) residual gyro triad calibration errors; (3) unequal delays that may occur on the stage of gyro triad signals conversation, transferring and processing; (4) cross-axis angular acceleration sensitivity of the mechanical type of gyro; (5) cross-coupling due to finite gain of gyro servos. | |  |

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| **A.S. Donnik, I.V. Merkuriev, V.V. Podalkov** | **Influence of linear vibration of the basis on dynamics of the hemispherical resonator gyroscope** | **62** |
| Hemispherical resonator gyroscope (HRG) is one of the perspective inertial sensors used in navigation systems [1]. Movement of the thin bell - shaped resonator of a vibrating resonator gyroscope has been considered. It is supposed, that the thickness of the resonator changes on district coordinate under the harmonious law. Low-frequency fluctuations on a bend of the resonator are investigated. The problem about elastic displacement of the resonator on the basic form of fluctuations has been put and solved. Using the Lagrange approach, the differential equations of the resonators movement are received. The analytical decision describing compelled fluctuations of the resonator has been received. It is shown, the second harmonic of heterogeneity of resonator's thickness is responsible for gyro sensitivity to projection of external vibration of foundation on the gyro input axis. The first and third harmonics are responsible for the gyro sensitivity to vibrations orthogonal to the input axis. | |  |

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| **Victor Fedossov, Milan Chvojka** | **The high sensitive microaccelerometer MAC-04 (development and application)** | **68** |
| This article describes the real-time method of non-conservative accelerations measurement on spacecraft board. The development of a special measurement instrument - the microaccelerometer - its block diagram, control concept and its application in space research projects are presented in this paper also. | |  |

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| **Christina Schneebauer, Maylin Wartenberg** | **From TMC tables to on-the-fly location referencing - methods for establishing traffic information services** | **77** |
| In this paper, we present different use cases for location referencing. We show how a full service chain for Traffic Information Services could be established and give an overview of the widely used method TMC. After a discussion about the growing requirements of telematics systems, a new approach to location referencing is presented: the on-the-fly methods. We discuss the difficulties regarding the development of on-the-fly methods and present the AGORA-C method which is currently in the standardisation process. We give an overview of the publicised test results using the AGORA-C method concerning its reliability and applicability. In addition to that, we present another algorithm for location referencing, MEI-LIN, which focuses on a better identification of a location using topological information of the surrounding road network. An outlook on the current research in Europe shows the main future tasks of establishing location referencing methods. | |  |

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| **E.A.Boyarsky, L.V. Afanasyeva** | **MAGELLAN-2 versatile software package for sea and air gravity measurements processing and analysis** | **91** |
| MAGELLAN software package was created in 1970s in the Institute for Physics of the Earth, Russian Academy of Sciences. The package processed and analyzed shipborn gravity measurements on IBM-360 computers. Some concepts of MAGELLAN have been included in the Instruction on Sea Gravity Measurements. The package was notable for (a) versatility and easiness of adaptation to various gravimeter types, as well as survey and adjustment methods, (b) convenience and simplicity in usage and analysis of results at each stage (in particular, in visualizing results), (c) scientifically well-founded approaches to the overall accuracy estimation of both measurements and output results. Special attention was paid to the analysis of coordinates and the Eotvos correction. These features have made MAGELLAN popular in a number of organizations. In 1988, the All-Union conference recommended MAGELLAN as a base package to all institutions making sea measurements of the gravity. Later the package was upgraded to IBM compatible personal computers. In 2002-2004šMAGELLAN-2 version of the package for WINDOWS was developed. This version has greatly enlarged number of ciphers for quantities in input and output files and limits of array lengths. A new format for sea and air gravity data exchange and storage (MVF-05) is expected to be adopted in the near future. MAGELLAN-2 deals directly with gravity catalogue in MVF-05 format. Most of MAGELLAN programs were successfully tested at FGUGP "Yuzhmorgeologiya". | |  |

**Brief note**

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| --- | --- | --- |
| **V.Yu. Karelin** | **On algorithmic correction of some errors of strapdown MWD systems during drilling** | **105** |
| Methods of algorithmic correction of some PIS-blocks errors during drilling are described. First of all the magnetometer blocks, when drilling device is located in a container made of steel non-magnetic tubes, that have local magnetization zones due to prolonged operation, or when the undersized container is used. These methods are based on PIS sensitivity axis rotation by nonnormalized angle in measurement plane. | |  |

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| --- | --- |
| **Two days in Tula (the visiting session of the Presidium of the Academy of Navigation and Motion Control)** | **109** |
|  | |

|  |  |  |
| --- | --- | --- |
| **N.V. Faldin** | **Analysis and synthesis of the relay self-oscillating control systems** | **112** |
| The methods of analysis of relay feedback systems with linear and nonlinear plants are described. These methods are based on the concept of the state locus (SL) of the relay feedback system. Analytical and numerical techniques of the state locus computing are proposed. The relations (14), (15) allows for a finding a periodic motion in the relay system. The algebraic criterion of local orbital stability of those periodic motions is stated. Stability is determined by eigenvalues of matrix (17). A few techniques of computing this matrix are developed. The two methods of relay system linearization on useful signal are proposed. The first one is suitable if the system contains static nonlinearities and limiters. It reduces relay system to some linear system. The second one is suitable for any nonlinearity in plant. In this case relay system is replaced by linear discrete system. Both of these methods are very precise. These methods let simplify servo mode exploration. It is very important for relay system designing. | |  |

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| **V.Ya. Raspopov, A.P. Markov, Yu.V. Ivanov, D.M. Malyutin, A.A. Gorin, R.V. Alaluyev, V.V. Matveyev** | **Roll rotating missile lateral oscillation damping with the use of microgyro** | **125** |
| The possibility of the micro gyroscope usage for the rolling missile angle stabilization system is considered. The results of the modeling and experimental research of the micro gyroscope made by the Central Research Institute "Electropribor" are given in the work. There is a description of the bench-test plant where the results of the experiments were received. There are results of the tests, confirming the principle possibility of micro gyroscope usage in the angle stabilization system. There were formulated the requirements to the micro gyroscope characteristics which are need to be improved. | |  |

**Information**

|  |  |
| --- | --- |
| **Russian and international conferences, symposiums, and exhibitions** | **129** |

|  |  |
| --- | --- |
| **Abstracts of the published papers** | **135** |