**"Gyroskopiya i Navigatsiya" №1, 2003**

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| The analytic expressions for estimation of a micromechanical gyroscope (MMG) sensitivity threshold due to thermal fluctuations were derived on the basis of information-energetic theory. Formulas describe the sensitivity threshold of an ideal device, mechanical and electrical noises of which were reduced to naught. Numerical estimations obtained from formulas are important for assessment of the different variants practicability and for determination of main factors limiting MMG accuracy.  In order to reduce MMG sensitivity threshold it is recommended to increase secondary oscillation quality factor and primary oscillation amplitude. For increasing primary oscillation amplitude it is necessary to increase its quality factor and excitation driver torque taking into account the nascent mechanical strains.  Predictable MMG accuracy improvement up to tenth or hundredth degree per hour is connected with development of the high quality factor, large amplitude oscillators and reduction of mechanical and electrical noises almost to naught. | |  |

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| **L.N.Belyanin** | **A borehole gyro system for orientation of the three-component seismic probe** | **19** |
| The system is designed for multi wave seismoprospect. Three components seismic probe is placed into hole device that is pressed to hole side at the registration moment and has arbitrary orientation. It's necessary to orient probe in horizontal coordinate system so as sensitive axes of two seismic receivers will place in vertical plane that contains excite point. One of the sensitive axes is vertical.  At first moment it is proposed to determine seismic receivers orientation by analytical gyro compassing system relatively to horizontal geographical oriented coordinate system. Then virtual turn of seismic receivers' sensitive axes is made by their signal transformation into horizontal coordinate system. The last one is connected with direction on excite point. Complex functional scheme is shown on fig.1.  Orientation angles calculations and coordinate transformation algorithms are given. Results of gyro orientation module experimental samples' tests that have verified efficiency of system construction principle and calculation algorithms are presented. | |  |

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| **S.K.Volovodov, M.G.Chernyaev,  A.Yu.Kaverinsky, S.S.Volovodov** | **Allocation of control resources in attitude stabilization of moving vehicles** | **30** |
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**Materials of the 9th Saint Petersburg International Conference  
on Integrated Navigation Systems**

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| **O.Shiele, A.Kleusberg, R.Horn** | **A comparison of two integrated airborne positioning and orientation systems** | **43** |
| Airborne remote sensing systems like Laser Scanners, Digital Line Cameras, Synthetic Aperture Radar (SAR) are systems of choice for fast acquisition of mass topographic data. For georeferencing purposes, these sensor systems rely on external positioning and orientation support of extremely demanding accuracy. Sensor position and orientation is typically provided by an integrated measurement and processing unit including a (differential) Global Positioning System (GPS) receiver and an Inertial Measurement Unit (IMU). Conventional analogue airborne photogrammetry and Digital Frame Cameras also benefit greatly from such external positioning/orientation provision.  Two such integrated sensor positioning and orientation systems are commercially available: the CCNS/AEROcontrol-IIb of IGI of Kreuztal/Germany and the POS/AV510 of Applanix of Richmond/Canada. These two systems were flown side-by-side in the DLR (German Aerospace Centre) fixed-wing aircraft during a SAR data acquisition mission. Post mission data processing of the GPS and IMU data yielded separate sensor trajectories (position, velocity, orientation) for the two systems at a data rate of 200 Hz for the POS/AVTM510 and 50 Hz for the CCNS/AEROcontrol-IIb, for a total flight duration of about two hours and 40 min. The two trajectories are analysed and compared in order to identify any shortcomings in either system, and in order to cross-check if the two systems meet their advertised performance specifications. | |  |

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| **A.E.Sinelnikov, V.N.Kudryavtsev, P.A.Pavlov** | **A new Russian standard in the field of low-frequency motion quantities measurements** | **63** |
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**Materials of the 23th Conference in memory of N.N.Ostryakov**

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**Brief notes**

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| **G.B.Volfson** | **New technologies in gravity gradiometry** | **99** |
| The manufacturing field for traditional geological models of gravity gradiometers and variometers with the beam torsion suspension has been in depression during the last ten years, though different branches of economy and scientific research are interested in the devices measuring the second derivatives of the gravity field.  Modern production technologies for gravy-inertial devices together with the scientific-and-technical backlog formed at gravity variometers development by the CSRI Elektropribor make possible the gravity gradiometry revival for solving tasks of exploration and industrial geological survey and research activities with the performance specifications highly exceeding the level of those of the former manufactured devices. The element base of the modern gyroscopy uses a working medium non-contactly suspended in electromagnet and electrostatic fields in vacuum with the help of electronics and automatics. These technologies create the prerequisites for qualitative evolution of technical means for gravity gradiometry.  The base module in complete sets of different-purpose devices is the sensor of gravity variometer with the beam axisymmetric magnet suspension. Its prototype is developed for use as a part of geophysical equipment. Besides the solution of traditional problems for the geological survey these devices can ensure the development of new trends for gravity gradiometry application such as drill hole monitoring and executive prediction of hard earthquakes in distant areas. | |  |

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