**"Gyroskopiya i Navigatsiya" №1, 2008**

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| The present paper deals with the scientific and technical grounds for development of satellite navigation airborne equipment (SNAE) and covers the full spectrum of problems faced by SNAE designers, namely: analysis of the satellite radio navigation system (SRNS) application aboard an artificial satellite, SNAE architecture synthesis, methods of signal primary processing in space-borne SRNS receivers, secondary processing methods of SRNS signals parameters measurements aboard an artificial satellite and SNAE pre-flight functional testing principles. | |  |

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| **M.A. Barulina, V.E. Dzhashitov, V.M. Pankratov, M.A. Kalinin, A.A. Papko** | **Mathematical model of micromechanical accelerometer with consideration for temperature effects, thermoelastic deflected mode and dynamic effects** | **55** |
| The given work essentially develops the researches, devoted to designing, research and creation of the precision micromechanical accelerometer. Object of research - developed in Research institute of physical measurements from Penza, the micromechanical accelerometer (fig.1) operating in conditions of temperature and mechanical effects. The purpose of work are: Construction of complex mathematical model of the accelerometer and its basic micromechanical sensing element (MSE), allowing to count and to research Influence of mechanical and temperature effects, geometrical, electromechanical, other characteristics and parameters on a out signal of the device in view of dynamic effects. For achievement of the purpose are consistently solved the following connected problems. 1. Hierarchical mathematical models of thermal processes (1)-(2), (fig. 2, 3) are constructed and non-stationary, three-dimensional temperature fields of all accelerometer with the distributed sources of heat release and including in its structure MSE are researched (the table, fig. 6, 7). 2. The certainly-element model (fig. 4) of the micromechanical sensing element is constructed and thermo elastic intense-deformed state MSE in view of mechanical and temperature effects is researched (fig. 8-11). 3. The mathematical model of dynamic drift of the accelerometer caused by its temperature and deformation fields and mechanical effects is constructed (3)-(6), (fig. 5) and is researched (fig. 12, 13). Recommendations on minimization of drift of the accelerometer are developed. During realization of activity it is developed supporting algorithmic and the software using both universal programs of certainly-element analysis ANSYS, and specially created original program complexes. | |  |

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***History pages***

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| Directional gyros and artificial horizons with their rotors suspended in two gimbals are well-known instruments in navigation. It is widely accepted that the first device showing already this kind of rotor support is an apparatus developed about 200 years ago at the University of Tubingen, Germany, by Prof. J.G.F. Bohnenberger. The original version of this instrument had been manufactured several times in Tubingen. Unfortunately, all of the initial specimens seemed to be lost since a long time, but recently one of them was discovered during an inventory at a school in Tubingen. For this reason, the article introduces the instrument retrieved, portrays its inventor, and outlines some historical circumstances. | |  |

**Information**

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