

# CRITERIA OF DISCRETE PHASE CONTROL OF BLADE WORKING CONDITION AND THEIR FEASIBILITY IN SYSTEMS OF TURBINE DRIVEN SET AUTOMATIC CONTROL

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The paper presents a brief survey of diagnosis methods and means for the control of working condition of turbomachine blades. Information criteria of detecting the faulty state of turbomachine blades, in case of using a peripheral sensor only, are defined and justified. The results of computer modeling are presented.

*Turbomachine, turbine, blades, sensor, discrete phase method, measurements, diagnosis.*

## References

1. Zablotsky, I. Ye. Contactless measurements of turbomachine blade vibrations / I. Ye. Zablotsky, Yu. A. Korostelev, R. A. Shipov. – Moscow: Machinostroyeniye, 1977 – 160 pp.
2. Oleynikov, V. A. Discrete phase method of measuring gas-turbine engine rotor blade deformations without using root sensors / V. A. Oleynikov, A. A. Yermakov // Aircraft industry. – 1986. – No. 9. – pp. 31-33.
3. Danilin, A. I. Optoelectronic discrete phase method of determining turbomachine blade deformation parameters / A. I. Danilin // Vestnik (bulletin) of Samara State Aerospace University. – 2000. – No. 1(3). – pp. 74-81.
4. Gurov, A. F. Construction and design of propulsion systems / A. F. Gurov, D. D. Sevruk, D. N. Surnov edited by A. F. Gurov. – Moscow: Machinostroyeniye, 1980. – 320 pp.
5. Buslenko, N. P. Monte Carlo method and its realization in digital machines / N. P. Buslenko, Yu. A. Shraiser. – Moscow: Fizmatgiz, 1961. – 226 pp.
6. Defining resonance frequencies of experimental blades of NK-12ST compressor rotor first stage: Report CI-38-81M. Certificate No. 10153 / Production Association named after Frunze, Central Plant Laboratory. Kuibyshev, 1988. – 14 pp.

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