
The study of forced vibrations with inertial disturbance

© V.V. Dubinin, V.V. Vitushkin

Bauman Moscow State Technical University, Moscow, 105005, Russia

The study presents a method of vibrations of different mechanical systems with inertial disturbance using a laboratory setup. It also describes the design and operation of this facility, methods of research and building calculated and experimental amplitude-frequency (AFC) and phase-frequency (PFC) characteristics. The article shows the possibility of applying this laboratory setup for simulating the vibrations of the objects, due to the similarity of differential equations of motion of various real industrial facilities and the laboratory setup. Similarity parameters are given, that makes it possible to carry out such modeling and receive frequency and phase response of various industrial applications.

Keywords: *mechanical systems, inertial disturbance, system vibrations, frequency characteristics, laboratory setup, modeling of vibrations, similarity parameters.*

REFERENCES

- [1] Dubinin V.V., Zhigulevtsev Yu.N., Nazarenko B.P., Remizov A.V. O vnedrenii novykh informatsionnykh tekhnologiy v uchebnyi protsess po kursu «Teoreticheskaya mekhanika» [On the introduction of new information technologies in the educational process in the course of Theoretical Mechanics]. *Nauchno-metodicheskaya konferentsiya, posvyashchennaya 35-letiyu obrazovaniya fakul'teta «Fundamental'nye nauki» MGTU im. N.E. Baumana, 20 dekabrya 1999 g. Moskva* [Sci. and method. conf. devoted to the 35th anniversary of the Faculty of Basic Sciences in Bauman MSTU, December 20, 1999 Moscow]. Moscow, Bauman MSTU Publ., 1999, pp. 65–66.
- [2] Dubinin V.V., Vitushkin V.V., Nazarenko B.P. Sovremenniy laboratornyy kompleks po teoreticheskoi mekhanike. Integratsiya obrazovaniya, nauki i proizvodstva [Modern laboratory complex on theoretical mechanics. Integration of education, science and industry]. *Materialy sektsionnogo zasedaniya Mezhdunarodnoi konferentsii IX Mezhdunarodnogo foruma «Vysokie tekhnologii XXI veka», 23 aprelya 2008 g. Moskva* [Section meeting of the International Conference of the IX International Forum "High Technologies of the XXI Century", April 23, 2008]. Moscow, Bauman MSTU, 2008, pp. 153–156.

Dubinin V.V. (b. 1937) graduated from Bauman Moscow Higher Technical School in 1961. Ph.D., Assoc. Professor of the Department of Theoretical Mechanics at Bauman Moscow State Technical University. Author of more than 250 scientific publications in the field of theoretical and applied mechanics. e-mail: fn3@bmstu.ru

Vitushkin V.V. (b. 1942) graduated from Bauman Moscow Higher Technical School in 1968. Ph.D., Assoc. Professor of the Department of Theoretical Mechanics at Bauman Moscow State Technical University. Author of more than 100 scientific publications in the field of applied aerogas dynamics and theoretical mechanics. e-mail: sovetm@bmstu.ru
