

DOI: [https://doi.org/10.15407/ techned2017.04.036](https://doi.org/10.15407/techned2017.04.036)

CREATION FEATURES OF ELECTROMECHANICAL SYSTEM FOR NANOSATELLITE ORIENTATION ON THE BASIS OF BRUSHLESS MAGNETOELECTRIC MOTOR

Journal	Tekhnichna elektrodynamika
Publisher	Institute of Electrodynamics National Academy of Sciences of Ukraine
ISSN	1607-7970 (print), 2218-1903 (online)
Issue	No 4, 2017 (July/August)
Pages	36 – 40

Authors

A. Antonov, K. Akinin, V. Kireev

Institute of Electrodynamics National Academy of Sciences of Ukraine,
pr. Peremohy, 56, Kyiv, 03057, Ukraine,
e-mail: aoe@ied.org.ua

Abstract

Creation features of the magnetoelectric slotless motor for orientation of the nanosatellite systems are considered. The principles of the selection motor characteristics to minimize the weight and size, power consumption and stray field generated by the magnetic excitation of the engine system are considered. References 13, figures 2, table 1.

Key words: nanosatellite, satellite orientation, reaction flywheel, brushless electric drive.

Received: 16.01.2017

Accepted: 20.03.2017

Published: 15.06.2017

References

1. Akinin K., Antonov A., Kireev V. Connecting method of discrete Hall sensors to control system of brushless motor with permanent magnets. Patent Application of Ukraine a201608818. (Ukr)
2. Antonov A., Petukhov I. The eddy current loss in the winding of the slotless electrical machine. *Tekhnichna Elektrodynamika*. 2010. No 4. Pp. 38–42. (Rus)
3. Antonov A., Kireev V. Dental Drill. Patent of Ukraine No 53776. (Ukr)
4. Balandina T.N., Balandin E.A. Electromechanical executive body on the basis of the DC brushless motor with a printed winding on the disk stator for small space vehicle. *Vestnik Sibirskogo Gosudarstvennogo Aviationsionnogo Universiteta*. 2015. ol. 16. No 1. Pp. 166–171. (Rus)
5. Ledovsky A. Electrical machines with high-coercivity permanent magnets. Moskva: Energoatomisdat, 1985. 169 p. (Rus)
6. The flywheel NRWA-T005 for orientation system of the microsatellite. Available at: <http://sat-serv.co.uk>
(accessed 11.01.2017)
7. About works in the Keldysh IPM of RAS for the analysis of dynamics, design and implementation of small satellite attitude control systems. Available at : http://keldysh.ru/papers/2006/source/prep2006_05.doc
(accessed 12.01.2017)
8. Pavlov V.A. The Basics of design and calculation of gyroscopic devices. Leningrad: Sudostroenie, 1967. Pp. 146–150. (Rus)
9. Putnikov V., Putnikov A., Uvarov V. Brushless DC motors with high operating time for space vehicles. *Elektrotehnika*. 2007. No 2. Pp. 18–23. (Rus)
10. Sysoeva S. Magnetic field sensors. *Komponenty i tekhnologii*. 2012. No 1. Pp. 19–32.

(Rus)

11. Flywheel controller MDM-05. Available at : <http://polus.tomsknet.ru> . (accessed 12.01.2017) (Rus)
12. Bushenkov V.A., Ovchinnikov M.Yu., Smirnov G.V. Attitude Stabilization of a Satellite by Magnetic Coils. Acta Astronautica. 2002. Vol. 50. No 12. Pp. 721–728. (Rus) DOI: [https://doi.org/10.1016/S0094-5765\(02\)00011-5](https://doi.org/10.1016/S0094-5765(02)00011-5)
13. Robert C. O`Handley. Modern Magnetic Materials: Principles and Applications. New York: John Wiley & Sons, 2000. 768 p.

[PDF](#)