

The theoretical and experimental study of claw pole alternators

Cristian BARZ¹, Constantin OPREA¹

¹North University of Baia Mare,
Department Electrical Engineering, Faculty of Engineering,
Baia Mare, Str. Victor Babes, nr. 62A, ROMANIA
cristian.barz@ubm.ro, prconstantin@yahoo.com

Abstract—The paper presents the tridimensional analysis of electromagnetic field of an claw poles alternator, in whose construction has been used non-magnetic material, such aluminum, that form the rings in the rotor's structure. This structure aims to establish lower levels of saturation in the claw-pole of Lundell alternator. Reducing the level of saturation in the rotor, lead to reduction of the losses in hysteresis, the power will be exchangeable in the output of the machine, while achieving its growth the performances.

REFERENCES

- [1] Sai Chun Tang, Member, IEEE, Thomas A. Keim, and David J. Perreault, Member, IEEE, „Thermal Modeling of Lundell Alternators”, IEEE TRANSACTIONS ON ENERGY CONVERSION, VOL. 20, NO. 1, MARCH 2005, pag 25
- [2] Ceuca, E.; Joldes, R.; Olteanu, E „Simulation of automotive alternator - solution for increasing electrical power”. Automation, Quality and Testing, Robotics, 2006 IEEE International Conference on Volume 1, Issue , 25-28 May 2006 Page(s):292 – 297
- [3] V. Comnac, M. Cernat, A. Mailat, J. Vittek, R. Rabinovici, „New 42 V Automotive Supply System Based on Conventional 14 V Alternator”, in Proceedings OPTIM 2008, Brasov, Romania, 22-24 May 2008, vol. II, pp. 271-276
- [4] St. Schulte, K. Hameyer „Computation of the Mutual Inductance between Rotor and Stator of Synchronous Claw-Pole Alternators regarding Claw Chamfers”, Institute of Electrical Machines, RWTH Aachen University, Schinkelstr. 4 52056 Aachen Germany, 2005
- [5] Christian Kaehler and Gerhard Henneberger, „Eddy-Current Computation in the Claws of a Synchronous Claw-Pole Alternator in Generator Mode”, IEEE TRANSACTIONS ON MAGNETICS, VOL. 38, NO. 2, MARCH 2002 1201
- [6] Barz C., Oprea C., Chiver O., „Modelig of Lundell alternator”, 6-th Japanese-Mediterranean Workshop on Applied Electromagnetic Engineering for Magnetic, Superconducting and Nano Materials, Extended Abstracts Conference Proceeding, pg. 193-194, ISBN 978-606-521-346-3, <http://japmed6.elth.pub.ro>, Bucuresti, 2009.
- [7] O. Chiver, E. Micu si C. Barz, „Stator winding leakage inductances determination using finite elements method”, OPTIM 2008, Proceeding of the 11 th International Conference on Optimization of Electrical and Electronic Equipment, 22-23 May 2008, Braşov, IEEE XPLORE INSPEC, pag. 69-74
- [8] x x x - www.infolytica.co.uk