

ICEMS 2004

International Conference on Electrical Machines and Systems Oct. 31 ~ Nov. 3, 2004 Jeju Island, Korea

Topic Area: PM / Superconducting Machines

Paper No. : PF-8 (614-M06-078)

Title: A Novel Design Method using 3D Equivalent Magnetic Circuit Network in Superconducting Motor

Authors: Ji-Young Lee, Sung-Il Kim, Jung-Pyo Hong (Changwon National Univ., Korea), Seung-Kyu Baik, Myung-Hwan Shon, Young-Kil Kwon (Korea Electrotechnology Research Inst., Korea)

Date and Time: November 2, 2004 Tuesday 10:40 - 12:10

Venue: Lobby B

- Abstract -

This paper presents a novel design method for superconducting motors. In order to consider large air-gap and the characteristics of superconductor, three dimensional equivalent magnetic circuit network method (3D EMCN) is used in design process. The proposed design process consists of four steps. Firstly the ranges of electrical parameters, such as electromotive force and synchronous reactance, are investigated to get object output characteristics under specifications. And then, the detail motor dimensions are decided within the range of the parameters. In third step, the parameters are obtained by analysis using 3D EMCN. At last, the characteristics of designed model are confirmed.

International Conference
on Electrical Machines and Systems 2004

ICEMS 2004

October 31 ~ November 3, 2004 Jeju Island, Korea



KIEE

Organized by:

KIEE (The Korean Institute of Electrical Engineers)

Co-organized by:

CES (China Electrotechnical Society)

IEEJ (The Institute of Electrical Engineers of Japan)

In Co-operation with :

IEEE IAS (Industry Applications Society)



CES

Sponsored by:

MOST (Ministry of Science and Technology)

MOCIE (Ministry of Commerce, Industry and Energy)

ATS (Agency for Technology and Standards)

KEPCO (Korea Electric Power Corporation)

KOEMA (Korea Electrical Manufacturers Association)

KERI (Korea Electrotechnology Research Institute)

KETI (Korea Electronics Technology Institute)

KAERI (Korea Atomic Energy Research Institute)

KIER (Korea Institute of Energy Research)

KRRI (Korea Railroad Research Institute)

KATECH (Korea Automotive Technology Institute)



IEEJ

Administration Office

HCEM (Human Resource Development Center for Electric Machine and Devices)



PF-3 (430-M06-039)

Vibration Minimization of PMLSM by using the Jerk Continuity Acceleration curve

Kang-Jun Yoon, Dong-Yeup Lee, Gyu-Tak Kim, Yong-Hyu Choi, Won-Jee Chung (Changwon National Univ., Korea)

PF-4 (430-M06-040)

Permanent Magnet Shape Optimization of moving Magnet type PMLSM for Thrust Ripple Minimization

Kang-Jun Yoon, Dong-Yeup Lee, Gyu-Tak Kim, Dae-Sun Hong (Changwon National Univ., Korea)

PF-5 (513-M06-064)

An Overview of Hybrid Excitation Permanent Magnet Machines

Zhu Xiaoyong, Ming Cheng (Southeast Univ., China)

PF-6 (513-M06-067)

Design Consideration for a 1MW Class Superconducting Synchronous Machine

S.K. Baik, M.H. Sohn, E.Y. Lee, Y.K. Kwon (Korea Electrotechnology Research Institute, Korea), T.S. Moon, H.J. Park, Y.C. Kim (Doosan Heavy Industries & Construction Co., Ltd., Korea)

PF-7 (604-M06-073)

Development of 3-D actuator using HTS bulk superconductor

Shingo Okamura, Akihiro Shimizu, SeokBeom Kim, Satoru Murase (Okayama Univ., Japan)

PF-8 (614-M06-078)

A Novel Design Method using 3D Equivalent Magnetic Circuit Network in Superconducting Motor

Ji-Young Lee, Sung-Il Kim, Jung-Pyo Hong (Changwon National Univ., Korea), Seung-Kyu Baik, Myung-Hwan Shon, Young-Kil Kwon (Korea Electrotechnology Research Inst., Korea)

PF-9 (629-M06-093)

An improvement in cogging torque of PMSM by Slot/Pole ratio

Hideo Dohmeki, Yosihiko Shoji (Musashi Inst. of Tech., Japan)

PF-10 (630-M06-098)

Fundamental Design and Parameter Optimization Study of HTS Superconducting Generators

Hiroshi Oso, Naoki Maki (Tokai Univ., Japan)

PF-11 (630-M06-100)

Characteristic Analysis of Permanent Magnet Assisted Synchronous Reluctance Motor for High Power Application

Young-Jin Jang, Mi-jeong Lee, Jung-Ho Lee (Hanbat National Univ., Korea)

PF-12 (617-M06-083)

Parameter Modeling of Multi-Layer Buried Magnet Synchronous Motor using Fixed Permeability Method

Sang-Yeop Kwak, Jae-Kwang Kim, Hyun-Kyo Jung (Seoul National Univ., Korea)

PF-13 (430-M06-042)

Two-dimensional Drive by Surface Motor using Halbach Permanent Magnets

Hiroyuki Ohsaki, Yasunori Kawamoto, Yosuke Otani (Univ. of Tokyo, Japan)

PF-14 (507-M06-061)

3-D FEM Analysis and Formulation of Thrust and Attractive-Normal Forces in SLIM

K. Yoshida, T. Yoshida, K. Noda, Y. Takahara (Kyushu Univ., Japan)

PF-15 (430-M06-025)

Analysis of BLDC motor considering magnet overhang effect

Deok-Jin Kim, Byung-Taek Kim, Sung-Ho Lee, Jin-Soo Park (LG electronics Inc, Korea)

PF-16 (430-M06-028)

Analysis on Over-Current Characteristics of HTSC Tape for AC Applications

Sung-Hun Lim (Chonbuk National Univ., Korea), Seong-Woo Yim (Korea Electric Power Research Inst., Korea), Jong-Hwa Lee (Chonbuk National Univ., Korea), Si-Dole Hwang (Korea Electric Power Research Inst., Korea), Byoung-Sung Han (Chonbuk National Univ., Korea)