OMM – Short CV

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OLE-MORTEN MIDTGÅRD

PERSONAL DETAILS

- Date of Birth: 1967
- Nationality: Norwegian (born in Tromsø, Norway)
- Place of Residence: Grimstad, Norway

UNIVERSITY EDUCATION

1994-1997 Dr.ing. (PhD) in Electrical Power Engineering, Norwegian University of Science and Technology, Trondheim, Norway

- Dissertation: Construction and Assessment of Hierarchal Edge Elements for Three-Dimensional Computations of Eddy Currents

1987-1992 Sivilingeniør (Masters degree) in Electrical Power Engineering, Norwegian Institute of Technology, Trondheim, Norway

- Thesis: Design of a New LHC Lattice Quadrupole Magnet (written at CERN – The European Laboratory for Particle Physics, Geneva, Switzerland)

PRESENT POSITION

2004- University of Agder, Faculty of Engineering and Science, Grimstad, Norway

Position: Professor

Research interests in broad terms:

- Electromagnetic modeling and simulation (theory and applications of field calculations and electric circuits)
- Energy conversion (electromechanical, electric-electric and photon-electric)
- "New renewable" energy (photovoltaic and wind)

Courses developed, or under development:

- MAS401: Electric Drives (5 ECTS 4th year Master's degree course at UiA)
- ENE219 Power Electronics (10 ECTS 3rd year Bachelor's degree

E-MAIL OLE-MORTEN.MIDTGARD@UIA.NO

HOME ADDRESS TORALDÅSEN 59, N-4886 GRIMSTAD, NORWAY

PHONE +47 41 80 19 86

course at UiA)

- ENE220 Electric Power Systems (10 ECTS 2nd year Bachelor's degree course at UiA)
- EK6106 Power Electronics (5 ECTS 3rd year Bachelor's degree course at Telemark University College)
- MT-602 Electromagnetic modeling (5 ECTS PhD-course at UiA)
- FENxxx Electrical Engineering for Renewable Energy (10 ECTS Master's degree course at UiA)

OTHER POSITIONS AFTER UNIVERSITY EDUCATION

1998-2003 ABB, Norway

Position: Senior Research Scientist

- Various R&D-projects @ ABB Corporate Research and ABB Automation Division

1994-1997 Norwegian University of Science and Technology, Trondheim, Norway

Position: Fellow

- Earned a Doctorate, and had teaching duties in various courses within the area of Electrical Power Engineering

1993 CERN – The European Laboratory for Particle Physics, Geneva, Switzerland

Position: Technical student

- Performed early design calculations of magnetic fields in the main quadrupoles for The Large Hadron Collider

LANGUAGES

- Norwegian: mother tongue
- English: very good, written and oral

MEMBERSHIPS IN PROFESSIONAL ASSOCIATIONS

- Member of IEEE (The Institute of Electrical and Electronics Engineers)
- Member of Tekna (The Norwegian Society of Chartered Technical and Scientific Professionals)
- Elected member of Agder Vitenskapsakademi (Agder Academy of Sciences and Letters)
- Member of Norsk Elektroteknisk Forening (Norwegian Society for Electrical Engineering)

E-MAIL OLE-MORTEN.MIDTGARD@UIA.NO

HOME ADDRESS TORALDÅSEN 59, N-4886 GRIMSTAD, NORWAY

PHONE +47 41 80 19 86

LIST OF PAPERS, REPORTS, THESES, PATENTS AND ORIGINAL LECTURE NOTES

Journal papers

[1] O.M. Midtgård, "Electrostatic field theory and circuit analysis in the design of coalescers with pulsed dc voltage," Chem.Eng.J. (2009), doi:10.1016/j.cej.2009.02.014 (in press)

[2] O.M. Midtgård, "Erfaringer med et praktisk orientert kurs i Kraftelektronikk ved Høgskolen i Agder," contribution in "Fra undervisning til læring: høgskolepedagogikk under kvalitetsreformen," Skriftserien nr. 128, Høgskolen i Agder, Kristiansand, 2006, pp. 193-209, ISBN 82-7117-592-0 [in Norwegian, education paper][1]

[3] O.M. Midtgård, "Representation of Current Density in a Three-Dimensional Hierarchal Edge Finite Element Method Solving Directly for the Magnetic Field," IEEE Transactions on Magnetics, Vol. 36, No. 4, 2000

[4] O.M. Midtgård and G. Sande, "A New Hierarchal Basis with a Minimum Number of Unknowns on a Mesh of Hexahedra for the T-Ψ Edge Element Eddy Current Method," IEEE Transactions on Magnetics, Vol. 34, No. 5, 1998

[5] O.M. Midtgård and R. Nilssen, "Efficient Spanning Trees for a High-Order Edge Element T-Ψ Eddy Current Formulation," IEEE Transactions on Magnetics, Vol. 34, No. 5, 1998

Scientific papers in Conference Proceedings

[6] O.M. Midtgård and T.O. Sætre, "A comparative simulation study of two-terminal multijunction cells versus connected individual cells in a spectrum splitting scheme," 23rd European Photovoltaic Solar Energy Conference, Conference Proceedings, pp.253-256, 1-5 September 2008 (ISBN 3-936338-24-8)

[7] O.M. Midtgård, "A Simple Photovoltaic Simulator for Testing of Power Electronics," 12th European Conference on Power Electronics and Applications, Conference Proceedings, paper 390, 2-5 September 2007, doi: 10.1109/EPE.2007.4417450

[8] O.M Midtgård, Nico Andersson, Erik Hoff, Lars Norum and Tore Undeland, "Development of a Computer Controlled Test Bench

[1] The paper is a short version of a longer, unpublished, report. Whereas the paper focuses on the pedagogical experience and results from a practically oriented course in power electronics, the longer report also contains reflections on electrical power engineering as an academic subject, a review of pedagogical developments at other institutions, and technical details. The longer report is available from the author on request, and is listed as reference [34] in this CV, under "Other technical reports".

for Long- and Short Term Assessment of Power Electronics for PV Modules, 21st European Solar Energy Conference, Conference Proceedings, pp. 2261-2264, 4-8 September 2006 (ISBN 3-936338-19-1)

[9] O.M Midtgård and T.O. Sætre, "Seasonal Variations in Yield for Different Types of PV Modules Measured Under Real Life Conditions in Northern Europe," 21st European Solar Energy Conference, Conference Proceedings, pp. 2383-2386, 4-8 September 2006 (ISBN 3-936338-19-1)

[10] O.M. Midtgård and G. Sande, "Application of Electric Vector Potential to Calculate Eddy Current Losses in Power Transformer Tanks," Proceedings of the 7th International Symposium on Electric and Magnetic Fields (EMF 2006), Aussois, France, June 19-22, 2006, Paper No. 34

[11] O.M. Midtgård, N. Andersson and T.O. Sætre, "Comparison of Fill Factor for Three Different Types of PV-Modules Under Changing Weather Conditions," 20th European Solar Energy Conference, Conference Proceedings, pp. 2147-2150, 6-10 June 2005 (ISBN 3-936338-20-5)

[12] N. Andersson, O.M. Midtgård and T.O. Sætre, "Low Cost I-V Curve Simulator Using Software Controlled Analog Electronics," 20th European Solar Energy Conference, Conference Proceedings, pp. 2151-2154, 6-10 June 2005 (ISBN 3-936338-20-5)

Short papers (synopses) in Conference Records

[13] O.M. Midtgård and G. Sande, "Application of Electric Vector Potential to Calculate Eddy Current Losses in Power Transformer Tanks," Seventh International Symposium on Electric and Magnetic Fields (EMF 2006), Symposium Record, June 2006, 2 pages [Reference [10] is an extended version]

[14] G. Sande and O.M. Midtgård, "Multi-disciplinary simulations on a novel high-voltage subsea connector," Fifth International Symposium on Electric and Magnetic Fields (EMF 2000), Symposium Record, May 2000, 2 pages

[15] O.M. Midtgård, "Representation of Current Density in a Three-Dimensional Hierarchal Edge Finite Element Method Solving Directly for the Magnetic Field," COMPUMAG Sapporo, Japan, October 25-28, 1999, Conference Record, pp. 734-735 [Reference [3] is an extended version]

[16] O.M. Midtgård, R. Nilssen and G. Sande, "A new hierarchical basis with a minimum number of unknowns on a mesh of hexahedra for the T-Ψ edge element eddy current method," COMPUMAG Rio de Janeiro, Brazil, November 2-6, 1997 Conference Record, pp. 777-778 [Reference [4] is an extended version]

E-MAIL OLE-MORTEN.MIDTGARD@UIA.NO

HOME ADDRESS TORALDÅSEN 59, N-4886 GRIMSTAD, NORWAY

PHONE +47 41 80 19 86

[17] O.M. Midtgård and R. Nilssen, "Efficient trees for edge element T-Ψ eddy current formulation including voltage- and current forced conductors," COMPUMAG Rio de Janeiro, Brazil, November 2-6, 1997 Conference Record, pp. 783-784 [Reference [5] is an extended version]

Articles written for the general public

[18] O.M. Midtgård, "Forskningsetikk og forskerens ansvar sett fra et ingeniørvitenskapelig perspektiv," Invited speech at Seminar on Ethics in Research, arranged in conjunction with visit from the Minister of Research and Higher Education Tora Aasland, University of Agder, Kristiansand, 22. April 2008 [in Norwegian]. Available from the author on request.

[19] J.N. Gundersen, J. Burgold, H. Middleton, O.M. Midtgård, H.K. Nielsen and H. Næser "The Energy Park as a Tool for Education in Renewable Energy," 10th International Conference on Technology Policy and Innovation, Conference Proceedings, 17-20 June 2007

[20] O.M. Midtgård, "Pinlig svak satsing," article in Dagbladet, (p. 48), 9. April 2007, www.dagbladet.no/kultur/2007/04/09/497216.html [in Norwegian].

[21] O.M. Midtgård, "Norge bør produsere elektrisitet fra solceller," article in Aftenposten, economy section (p. 8), 19. Dec. 2006, www.aftenposten.no/meninger/debatt/article1574763.ece [in Norwegian].

[22] O.M. Midtgård, short articles in the newsletter "Energinytt" [in Norwegian]:

[22A] "Målinger på solcellepaneler i Energiparken," No. 13, 2007

[22B] "Bør Norge produsere elektrisitet fra solceller?" No. 12, 2006

[22C] "Eksperimenter på solcellepaneler i Energiparken," No. 8, 2004

[22D] "Ole-Morten Midtgård – ny professor I elkraftteknikk," No. 8, 2004

[23] O.M. Midtgård, "Kostnadseffektive 3D-beregninger av induserte strømmer i elkraftanvendelser," Elektro, No. 5, 1998 [in Norwegian]

[24] O.M. Midtgård, "Min doktorgrad: Arven etter Maxwell i elkraftteknikken," Universitetsavisa (Trondheim), No. 4, 1997, www.ntnu.no/universitetsavisa/nr4/re6.html [in Norwegian]

Industry reports for ABB

[25] J. Miderbäck and O. M. Midtgård, "Safety in application compile," ABB Automation Technology Products, Description of function,

E-MAIL OLE-MORTEN.MIDTGARD@UIA.NO

HOME ADDRESS TORALDÅSEN 59, N-4886 GRIMSTAD, NORWAY

PHONE +47 41 80 19 86

Doc. No. 3BSE030104, 2003 (94 pages)

[26] K. Asskildt and O.M. Midtgård, "MEMS IP regulator valve," ABB Corporate Research, Technical Report, Doc. No. NOCRC ADT200103, 2001 (48 pages)

[27] E. Sande, O.M. Midtgård, K.S. Svensen, R. Sporild, "Method for design of water cooling (Metode for design av vannkjøling)," ABB Corporate Research, Technical Report NOCRC PSC200104, 2001 (11 pages)

[28] O.M. Midtgård, R. Sporild, E. Sande, K.S. Svensen, "Investigation of voltage stability in connection with wind power (Undersøkelse av spenningsstabilitet i forbindelse med vindkraft)," ABB Corporate Research, Technical Report NOCRC 200106, 2001 (44 pages)

[29] O.M. Midtgård, R. Sporild, E. Sande, K.S. Svensen, "Investigation of voltage stability in connection with HVDC (Undersøkelse av spenningsstabilitet i forbindelse med HVDC), main report," ABB Corporate Research, Technical Report NOCRC PSC200102, 2001 (67 pages)

[30] O.M. Midtgård, R. Sporild, E. Sande, K.S. Svensen, "Investigation of voltage stability in connection with HVDC (Undersøkelse av spenningsstabilitet i forbindelse med HVDC), additional results," ABB Corporate Research, Technical Report NOCRC PSC200103, 2001 (26 pages)

[31] O.M. Midtgård and N. Klippel, "Novel Coalescer Technologies in Process Plant 2000. Part I: Electrostatic Coalescer Technology, ABB Corporate Research, Technical Report NOCRC PSC9905, 1999 (47 pages)

[32] O.M. Midtgård, G. Sande, E. Sande, "Magnetic, Thermal and Structural Coupled Analyses of a High-Voltage Wet Mateable Connector," ABB Corporate Research, Technical Report NOCRC PSC9901, 1999 (31 pages)

[33] O.M. Midtgård, "Investigation of eddy current losses in steel plates and use of different materials in industry transformer tanks," ABB Corporate Research, Technical Report NOCRC PSC9808, 1998 (39 pages)

Other technical reports

[34] O.M. Midtgård, "Revitalisering av Kraftelektronikk – Utvikling og gjennomføring av et praktisk orientert kurs ved Høgskolen i Agder, Høgskolen i Agder, Grimstad 07.02.2006, unpublished report [in Norwegian, pedagogical report]. Available from the author on request. (48 pages)

[35] O.M. Midtgård and B. Johansen, "Voltage control of

E-MAIL OLE-MORTEN.MIDTGARD@UIA.NO

HOME ADDRESS TORALDÅSEN 59, N-4886 GRIMSTAD, NORWAY

PHONE +47 41 80 19 86

AkerKværner's CEC using Magtech technology," Magtech AS, Technical report, project 0021, Doc. No. 00210009D, 2004 (35 pages).

[36] O.M. Midtgård, "The T-Ψ Edge Finite Element Method for 3D Eddy Currents," Norwegian University of Science and Technology, Technical memo, Doc. No. KEM.96.003 (64 pages)

[37] O.M. Midtgård, "Equations for 3D eddy current problems," The Norwegian Institute of Technology, Technical memo, Doc. No. KEM95.004 (17 pages)

[38] The Research Council of Norway (Norges forskningsråd), "Kraftelektronikk 90. Faglig sluttrapport," (Power Electronics 90) Main results from the three reports below, that are not longer available, are refered to in this report.

[38A] O.M Midtgård, "Current source control loop for superconducting magnets at CERN (Reguleringssystem for strømkilde til superledende magneter i CERN)," POWEC AS, 1992

[38B] O.M Midtgård, "Current measurements (Strømmåling)," POWEC AS, 1992

[38C] O.M. Midtgård, "Field calculations on AC-DC inductor (Feltberegning AC-DC drossel)," POWEC AS, 1992

Theses by Ole-Morten Midtgård

[39] "Construction and assessment of hierarchal edge elements for three-dimensional computations of eddy currents," Norges teknisk-naturvitenskapelige universitet, Dr.ing. avhandling 1997:113, ISBN 82-471-0150-5

[40] "Design of a New LHC Lattice Quadrupole Magnet," NTH Institutt for elkraftteknikk, hovedoppgave 1992

Patents

[41] B. Johansen, O.M. Midtgård, "Fremgangsmåte for spenningsregulering av en krets med kapasitiv last (Procedure for voltage control of a circuit with a capacitive load," Norwegian Patent No. NO322439B (2006.10.09). (Originally filed 2004.02.03)

[42] E. Haugs, F. Strand, B. Johansen, O.M. Midtgård, "Kraftforsyningsstyringssystem og fremgangsmåte for styring av et kraftforsyningssystem med variable resistiv last (Control system for controlling a power supply with variable resistive load)," Norwegian Patent No. NO321594B1 (2006.06.06). (Originally filed 16.06.2004)

[43] O.M. Midtgård, B. Johansen, "Fremgangsmåte og anordning for styring av en kraftforsyning med en variabel last (Method and device for controlling power supplied to a variable load),"

E-MAIL OLE-MORTEN.MIDTGARD@UIA.NO

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PHONE +47 41 80 19 86

Norwegian Patent No. NO320108B1 (2005.10.24). (Originally filed 03.02.2004)

[44] B. Johansen, O.M. Midtgård, "Fremgangsmåte og anordning for strømbegrensning i en variabel last (Method and device for limiting a current in a variable load)," Norwegian Patent No. NO320040B1 (2005.10.17). (Originally filed 03.02.2004)

[45] P.J. Nilsen, O.M. Midtgård, G. Sande, "Electrostatic coalescer device," US Patent No. US 6,811,693 B2 (Nov 2, 2004). Also PCT WO0185297. (Originally filed 05.05.2000)

[46] B. Berggren, M. Hölleland, M. Leijon, M. Lundmark, O.M. Midtgård, B. Rothman, E. Sande, M. Sipi, R. Sporild, K.S. Svensen, "Synchronous compensation," US Patent No. 6,737,767 B2 (May 18, 2004). Also PCT WO0178215. (Originally filed 06.04.2000)

[47] N. Klippel, O.M. Midtgård, "Method for separating the constituents of a dispersion," US patent No. 6,428,669 B2 (Aug. 6, 2002). Also European and Norwegian patent. (Originally filed 27.12.1999)

[48] O.M. Midtgård, K. Asskildt, A. Nysveen, "MEMS pilot valve," US patent No. 7,124,773 B2 (Oct. 24, 2006). Also PCT WO03104693. (Originally filed 06.06.2002)

Patent pending

[49] T.A. Tveit, R. Kleivi, R. Moen, O.M. Midtgård, L. Gundersen, A. Nysveen, "System and method to provide maintenance for an electrical power generation, transmission and distribution system," PCT WO02054164. Also US2002087220. (Filed 29.12.2000.)

Original Lecture Notes (i.e. Lecture Notes that implement pedagogical ideas by OMM, and that have been or are used in courses at University of Agder)

[50] O.M. Midtgård, "Introduction to three-phase line-commutated rectifiers and inverters," 33 pages, 2005

[51] O.M Midtgård, " Prosjekt- og laboratoriekompendium i Kraftelektronikk," 19 pages, 2006 [in Norwegian]

[52] O.M. Midtgård, "Elektrisitetsforsyning i Norge: selvstudiumsøving med løsningsforlag," 16 pages, 2007 [in Norwegian]

[53] O.M. Midtgård, "Introduction to an integrated electric energy system that includes a photovoltaic generator," 11 pages, 2008

[54] O.M. Midtgård, "Ideas for simple implementation of a step-down dc-dc chopper," 12 pages, 2008

E-MAIL OLE-MORTEN.MIDTGARD@UIA.NO

HOME ADDRESS TORALDÅSEN 59, N-4886 GRIMSTAD, NORWAY

PHONE +47 41 80 19 86