

Mats Alaküla
Industrial Electrical Engineering and Automation
LTH Profile Area: The Energy Transition
Type of address: Visiting address.
Ole Römers väg 1F
22363
Lund
Sweden



Type of address: Postal address.
Box 118
221 00
Lund
Sweden
Email: mats.alakula@iea.lth.se
Mobile: +46705589284
Phone: +46462229284

Research

Mats Alaküla started his scientific career 1986 as a PhD student in control and design of electrical machines and drives. This evolved into not least automotive applications from hybrid to full electric vehicles and Mats became a full Professor in Industrial Electrical Engineering in 1994.

His research render him a role as Scientific Advisor on Electromobility at AB Volvo, where he stayed for 14 years, after which moved on to Elonroad AB in a similar role and also as a research leader for 12 years in the Swedish Electromobility research centre.

Today Mats research evolves around electromobility, not least in energy supply to a full electric vehicle fleet, both on road, off road in farming, road construction and mining. Mats has many advisory roles in different committees, investigations and he is an appreciated lecturer.

Employment

Professor

Industrial Electrical Engineering and Automation
Lund University
Lund, Sweden
1994 Sept 21 → present

Profile area member

LTH Profile Area: The Energy Transition
Lund University
Sweden
2022 Sept 5 → present

Scientific advisor

Elonroad AB
Lund, Sweden
2021 Oct 1 → present

Scientific Advisor

Volvo AB
Sweden
2007 Sept 1 → 2021 Sept 30

Thematic area leader

Swedish Electromobility Centre
Sweden
2007 Jul 1 → 2019 Jun 30

Research outputs

Full electric farming with on-field energy replenishment

Wallander, E., Frank, B., Alaküla, M. & Márquez-Fernández, F. J., 2025 Jan 1, In: Applied Energy. 377, 124416.

The optimal capacity expansion planning for the terminals of the logistics company

Li, H. & Alaküla, M., 2024 Nov, In: Applied Energy. 374, 124005.

Reducing the Environmental Impact of Large Battery Systems with Conductive Electric Road Systems—A Technical Overview

Wenander, D. & Alaküla, M., 2024 Feb, In: World Electric Vehicle Journal. 15, 2, 59.

Efficiency evaluation of a conductive Electric Road System with respect to traffic characteristics

Wenander, D., Marquez-Fernandez, F. J. & Alakula, M., 2024, In: IEEE Transactions on Vehicular Technology. 73, 4, p. 4694-4704 11 p.

Measurements of the Electric Properties of the Current Collector in a Conductive Electric Road

Wenander, D., Marquez-Fernandez, F. J. & Alakula, M., 2024, *15th International Conference Elektro 2024, ELEKTRO 2024 - Proceedings*. Hockicko, P. & Dubovan, J. (eds.). IEEE - Institute of Electrical and Electronics Engineers Inc.

A Forecasting Based Hierarchical Energy Management for Sustainable Data Centers

Li, H., Alakula, M. & Gualous, H., 2023, *IECON Proceedings (Industrial Electronics Conference)*. IEEE Computer Society

An Economic Assessment of the Terminal Electrification for the Logistics Company

Li, H. & Alakula, M., 2023, *PEDG 2023 - 2023 IEEE 14th International Symposium on Power Electronics for Distributed Generation Systems*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 716-721 6 p.

Common Mode Current Measurements in Traction Systems for Electric Vehicles

Widek, P. & Alakula, M., 2023, In: IEEE Transactions on Industry Applications. 59, 2, p. 2061-2068 8 p.

Comparison of PMSM versus PMA-SynRM and IM from an Optimized Electric Vehicle Powertrain Perspective

Lu, M., Domingues-Olavarria, G. & Alaküla, M., 2023, *2023 26th International Conference on Electrical Machines and Systems, ICEMS 2023*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 4075-4080 6 p. (2023 26th International Conference on Electrical Machines and Systems, ICEMS 2023).

Electric off-road mobile machinery systems with portable energy supply and local energy generation

Wallander, E., Frank, B., Alakula, M. & Márquez-Fernández, F. J., 2023, *2023 IEEE Belgrade PowerTech, PowerTech 2023*. IEEE - Institute of Electrical and Electronics Engineers Inc.

Electro-thermal Models of Power Modules for Stochastic Optimization of Inverters

Byden, H., Bourniche, E., Domingues, G., Alakula, M., Leblay, A. & Marquez, F., 2023, *2023 IEEE Transportation Electrification Conference and Expo, ITEC 2023*. IEEE - Institute of Electrical and Electronics Engineers Inc.

Modelling Electric Transients in a Conductive Electric Road System

Wenander, D., Marquez-Fernandez, F. J. & Alakula, M., 2023, *2023 115th AEIT International Annual Conference, AEIT 2023*. IEEE - Institute of Electrical and Electronics Engineers Inc.

Optimization of Induction Machine Design for Electric Vehicle Powertrain

Lu, M., Domingues-Olavarria, G., Marquez-Fernandez, F. J., Byden, H. & Alakula, M., 2023, *2023 IEEE International Electric Machines and Drives Conference, IEMDC 2023*. IEEE - Institute of Electrical and Electronics Engineers Inc., (2023 IEEE International Electric Machines and Drives Conference, IEMDC 2023).

Optimization of Powertrain Platform for Electric Passenger Vehicles

Lu, M., Domingues-Olavarria, G., Byden, H., Aleksandar, M. & Alaküla, M., 2023, *2023 IEEE Transportation Electrification Conference and Expo, ITEC 2023*. IEEE - Institute of Electrical and Electronics Engineers Inc.

Parameter Identification For Inter Turn Fault Detection In Permanent-Magnet Synchronous Motors Using Stator Flux Linkage DC Offset Monitoring

Upadhyay, A., Reinap, A. & Alakula, M., 2023, *Proceedings of the 2023 IEEE 14th International Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives, SDEMPED 2023*. Zarri, L. & Lee, S. B. (eds.). IEEE - Institute of Electrical and Electronics Engineers Inc., p. 498-504 7 p.

Statistical Assessment of Core Loss Measurement Techniques for Laminated Steel

Colombo, L., Soltanipour, S., Tokat, A., Reinap, A., Thiringer, T., Marquez Fernandez, F. J., Lindström, J. & Alaküla, M., 2023, *Statistical Assessment of Core Loss Measurement Techniques for Laminated Steel*. IEEE - Institute of Electrical and Electronics Engineers Inc., (IEEE Workshop on Electrical Machines Design, Control and Diagnosis (WEMDCD); vol. 2023).

Dovetail Design for Direct Cooled Rotor: Design and Manufacturing

Estenlund, S., Tokat, A., Engqvist, J. & Alaküla, M., 2022 Oct 13, *2022 International Conference on Electrical Machines (ICEM)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2121-2127 7 p.

Performance Degradation due to Cut Edge Effect for an Axial-Flux Induction Machine

Colombo, L., Tokat, A., Bitsi, K., Marquez Fernandez, F. J. & Alaküla, M., 2022 Oct 13, *Proceedings - 2022 International Conference on Electrical Machines (ICEM)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 1253-1259 7 p.

Conductive Electric Road Localization and Related Vehicle Power Control

Karlsson, A. & Alaküla, M., 2022 Jan 17, In: *World Electric Vehicle Journal*. 13, 1, 17 p., 22.

Assessment of future EV charging infrastructure scenarios for long-distance transport in Sweden

Marquez-Fernandez, F. J., Bischoff, J., Domingues-Olavarria, G. & Alakula, M., 2022, In: *IEEE Transactions on Transportation Electrification*. 8, 1, p. 615-626

A Theoretical Study Of Stator Flux Linkage DC Offset Based Stator Fault Detection For PMSM Drive Systems

Upadhyay, A. & Alakula, M., 2022, *2022 IEEE Vehicle Power and Propulsion Conference, VPPC 2022 - Proceedings*. IEEE - Institute of Electrical and Electronics Engineers Inc.

Modelling of power flow and losses in a conductive Electric Road System

Wenander, D., Marquez-Fernandez, F. J. & Alakula, M., 2022, *2022 IEEE Vehicle Power and Propulsion Conference, VPPC 2022 - Proceedings*. IEEE - Institute of Electrical and Electronics Engineers Inc., (2022 IEEE Vehicle Power and Propulsion Conference, VPPC 2022 - Proceedings).

Energy supply to buses on a conductive electric road: An evaluation of charger topologies and electric road characteristics

Karlsson, A. & Alaküla, M., 2021 Dec 1, In: *World Electric Vehicle Journal*. 12, 4, 241.

Electric drivetrain optimization for a commercial fleet with different degrees of electrical machine commonality

Lu, M., Domingues-olavarria, G., Márquez-fernández, F. J., Fyhr, P. & Alaküla, M., 2021 Jun 1, In: *Energies*. 14, 11, 2989.

Concept design of electric cruise and startability axles for long haul heavy vehicles to maximise driving range

Janardhanan, S., Laine, L., Jonasson, M., Jacobson, B. & Alakula, M., 2021, *2021 IEEE Vehicle Power and Propulsion Conference, VPPC 2021 - ProceedingS*. IEEE - Institute of Electrical and Electronics Engineers Inc.

Measuring electric properties of a conductive electric road

Wenander, D., Abrahamsson, P., Marquez-Fernandez, F. J. & Alakula, M., 2021, *2021 AEIT International Conference on Electrical and Electronic Technologies for Automotive, AEIT AUTOMOTIVE 2021*. IEEE - Institute of Electrical and Electronics Engineers Inc.

Automatic static charging of electric distribution vehicles using ERS technology

Abrahamsson, P., Wenander, D., Alakula, M., Marquez-Fernandez, F. J. & Domingues-Olavarria, G., 2020, *2020 IEEE Transportation Electrification Conference and Expo, ITEC 2020*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 1191-1196 6 p. 9161573. (2020 IEEE Transportation Electrification Conference and Expo, ITEC 2020).

Integrated and isolated EV charger for AC and electric road applications

Karlsson, A. & Alakula, M., 2020, *2020 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2020*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 114-119 6 p. 9161877. (2020 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2020).

Modeling of electric power system in electric vehicles

Widek, P. & Alakula, M., 2020, *2020 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2020*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 293-298 6 p. 9161884. (2020 International Symposium on Power Electronics, Electrical Drives, Automation and Motion, SPEEDAM 2020).

Characterization of Onboard Condition Monitoring Techniques for Stator Insulation Systems in Electric Vehicles: A Review

Upadhyay, A., Alakula, M. & Marquez-Fernandez, F. J., 2019 Dec 9, *IECON 2019: 45th Annual Conference of the IEEE Industrial Electronics Society*. IEEE Computer Society, p. 3179-3186 8 p. 8926678. (IECON Proceedings (Industrial Electronics Conference); vol. 2019).

Thermal Modeling and Analysis of an Alternating Short-Segmented Conductive ERS

Abrahamsson, P., Márquez-Fernández, F. J. & Alakula, M., 2019 Dec, In: *IEEE Transactions on Transportation Electrification*. 5, 4, p. 1078-1086 9 p., 8746810.

Performance Estimation of a Traction Machine with Direct Cooled Hairpin Winding

Reinap, A., Andersson, M., Márquez-Fernández, F. J., Abrahamsson, P. & Alakula, M., 2019 Jun 1, *ITEC 2019 - 2019 IEEE Transportation Electrification Conference and Expo*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8790545

Thermal Assessment of an ERS for Static Charging of Electric Vehicles

Abrahamsson, P., Márquez-Fernández, F. J. & Alakula, M., 2019 Jun 1, *ITEC 2019 - 2019 IEEE Transportation Electrification Conference and Expo*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8790521

Using Multi-Agent Transport Simulations to Assess the Impact of EV Charging Infrastructure Deployment

Márquez-Fernández, F. J., Bischoff, J., Domingues-Olavarria, G. & Alakula, M., 2019 Jun 1, *ITEC 2019 - 2019 IEEE Transportation Electrification Conference and Expo*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8790518

Alternative EV powertrain topologies designed for operation in a conductive electric road system

Karlsson, A., Domingues-Olavarria, G. & Alakula, M., 2019 Jan 14, *2018 IEEE International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles and International Transportation Electrification Conference, ESARS-ITEC 2018*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8607748

Thermal modeling of an ERS during static charging

Abrahamsson, P. & Alakula, M., 2019 Jan 14, *2018 IEEE International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles and International Transportation Electrification Conference, ESARS-ITEC 2018*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8607497

Optimization of Electric Powertrains Based on Scalable Cost and Performance Models

Domingues-Olavarria, G., Marquez-Fernandez, F. J., Fyhr, P., Reinap, A., Andersson, M. & Alakula, M., 2019 Jan, In: *IEEE Transactions on Industry Applications*. 55, 1, p. 751-764 14 p.

Electric safety challenges with a conductive electric road system-Chassis potential modeling and measurement

Márquez-Fernández, F. J., Schuch, S., Lindgren, L. & Alakula, M., 2019, In: *World Electric Vehicle Journal*. 10, 2, 30.

Thermal modeling of an ERS during dynamic charging

Abrahamsson, P., Marquez-Fernandez, F. J. & Alakula, M., 2019, *2019 IEEE Vehicle Power and Propulsion Conference, VPPC 2019 - Proceedings*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8952465

Direct Conductor Cooling in Concentrated Windings

Reinap, A., Marquez-Fernandez, F. J., Alakula, M., Deodhar, R. & Mishima, K., 2018 Oct 25, *Proceedings - 2018 23rd International Conference on Electrical Machines, ICEM 2018*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2654-2660 7 p. 8507094

Lumped-parameter grey-box modelling of traction machines for low-speed operation

Hall, S. & Alakula, M., 2018 Oct 25, *Proceedings - 2018 23rd International Conference on Electrical Machines, ICEM 2018*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2668-2674 7 p. 8506982

Power Losses and Heat Extraction in a Stator with Directly Air-Cooled Laminated Windings

Reinap, A., Hogmark, C., Marquez-Fernandez, F. J., Alakula, M. & Andersson, M., 2018 Oct 25, *Proceedings - 2018 23rd International Conference on Electrical Machines, ICEM 2018*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2675-2681 7 p. 8506732

Electric roads: Analyzing the societal cost of electrifying all Danish road transport

Domingues-Olavarria, G., Márquez-Fernández, F. J., Fyhr, P., Reinap, A. & Alakula, M., 2018 Jun 7, In: *World Electric Vehicle Journal*. 9, 1, 9.

Assessment of cooling integration with direct cooled windings

Reinap, A., Gabassi, M., Alakula, M. & Andersson, M., 2018, *2018 IEEE International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles and International Transportation Electrification Conference, ESARS-ITEC 2018*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8607655

Dynamic Testing Characterization of a Synchronous Reluctance Machine

Wiedemann, S., Hall, S., Kennel, R. & Alakula, M., 2018, In: *IEEE Transactions on Industry Applications*. 54, 2, p. 1370-1378

Electric safety challenges with a conductive Electric Road System - Chassis potential modeling and measurement -

Márquez-Fernández, F. J., Schuch, S., Lindgren, L. & Alakula, M., 2018.

EV powertrain topologies for electric road applications

Karlsson, A., Domingues-Olavarria, G. & Alakula, M., 2018.

Dynamic Magnetic Model Identification of Permanent Magnet Synchronous Machines

Hall, S., Marquez-Fernandez, F. J. & Alakula, M., 2017 Dec 1, In: *IEEE Transactions on Energy Conversion*. 32, 4, p. 1367-1375 9 p., 7927753.

From Chip to Converter: A Complete Cost Model for Power Electronics Converters

Domingues, G., Fyhr, P., Reinap, A., Andersson, M. & Alakula, M., 2017 Nov 1, In: *IEEE Transactions on Power Electronics*. 32, 11, p. 8681-8692 12 p., 7814334.

Dynamic charging solutions in Sweden: An overview

Alakula, M. & Marquez-Fernandez, F. J., 2017 Oct 23, *2017 IEEE Transportation Electrification Conference and Expo, Asia-Pacific, ITEC Asia-Pacific 2017*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8080781

Electric roads: The importance of sharing the infrastructure among different vehicle types

Marquez-Fernandez, F. J., Domingues-Olavarria, G., Lindgren, L. & Alakula, M., 2017 Oct 23, *2017 IEEE Transportation Electrification Conference and Expo, Asia-Pacific, ITEC Asia-Pacific 2017*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8080780

Performance and manufacturability tradeoffs of different electrical machine designs

Fyhr, P., Domingues, G., Reinap, A., Andersson, M. & Alakula, M., 2017 Aug 3, *2017 IEEE International Electric Machines and Drives Conference, IEMDC 2017*. IEEE - Institute of Electrical and Electronics Engineers Inc., 8002181

Electric roads: Reducing the societal cost of automotive electrification

Fyhr, P., Domingues, G., Andersson, M., Márquez-Fernández, F. J., Bängtsson, H. & Alaküla, M., 2017 Jul 26, *2017 IEEE Transportation and Electrification Conference and Expo, ITEC 2017*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 773-778 6 p. 7993367

Scalable performance, efficiency and thermal models for electric drive components used in powertrain simulation and optimization

Domingues, G., Márquez-Fernández, F. J., Fyhr, P., Reinap, A., Andersson, M. & Alaküla, M., 2017 Jul 26, *2017 IEEE Transportation and Electrification Conference and Expo, ITEC 2017*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 644-649 6 p. 7993345

PM-less machine topologies for EV traction: A literature review

Estenlund, S., Alaküla, M. & Reinap, A., 2017 Feb 9, *2016 International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles & International Transportation Electrification Conference (ESARS-ITEC)*.

Societal cost of electrifying all danish road transport

Domingues-Olavarria, G., Márquez-Fernández, F. J., Fyhr, P., Reinap, A. & Alaküla, M., 2017 Jan 1, *EVS 2017 - 30th International Electric Vehicle Symposium and Exhibition 2017*. Landesmesse Stuttgart GmbH

Thermal design of an electric road system

Abrahamsson, P. & Alaküla, M., 2017 Jan 1, *EVS 2017 - 30th International Electric Vehicle Symposium and Exhibition*. Landesmesse Stuttgart GmbH, Vol. 2017.

Direct electromagnetic actuation on high ratio gears

Reinap, A., Alakula, M. & Domingues, G., 2016 Nov 2, *Proceedings - 2016 22nd International Conference on Electrical Machines, ICEM 2016*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 743-749 7 p. 7732609

A method for in-situ characterization of PMSM traction machines

Hall, S., Andersson, R. & Alakula, M., 2016 Aug 29, *EEEIC 2016 - International Conference on Environment and Electrical Engineering*. IEEE - Institute of Electrical and Electronics Engineers Inc., 7555698

Dynamic Testing characterization of a synchronous reluctance machine

Wiedemann, S., Kennel, R. M., Hall, S. & Alakula, M., 2016 May 20, *2016 11th International Conference on Ecological Vehicles and Renewable Energies, EVER 2016*. IEEE - Institute of Electrical and Electronics Engineers Inc., 7476426

Degradation and Fatigue of Epoxy Impregnated Traction Motors Due to Thermal and Thermal Induced Mechanical Stress: Part I: Thermal Mechanical Simulation of Single Wire due to Evenly Distributed Temperature

HUANG, Z., Reinap, A. & Alaküla, M., 2016, *8th IET International Conference on Power Electronics, Machines and Drives (PEMD 2016)*. Institution of Engineering and Technology

Degradation and fatigue of epoxy impregnated traction motors due to thermal and thermal induced mechanical stress - Part I: Thermal mechanical simulation of single wire due to evenly distributed temperature

Huang, Z., Reinap, A. & Alaküla, M., 2016, *IET Conference Publications*. CP684 ed. Institution of Engineering and Technology, Vol. 2016.

Degradation and fatigue of epoxy impregnated traction motors due to thermal and thermal induced mechanical stress - Part II: Thermal mechanical simulation of multiple wires due to evenly and unevenly distributed temperature

Huang, Z., Reinap, A. & Alaküla, M., 2016, *IET Conference Publications*. CP684 ed. Institution of Engineering and Technology, Vol. 2016.

Dielectric Properties Modeling and Measurement of Single Tooth Coil Insulation System under Accelerated Degradation Test

HUANG, Z., Reinap, A. & Alaküla, M., 2016, *IEEE International Conference on Electrical Machines (ICEM) 2016*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2698-2703 6 p. 7732903

Engineering considerations on skewing of an interior permanent magnet synchronous machine for parallel hybrid electric heavy vehicles

Andersson, R., Reinap, A. & Alaküla, M., 2016, *IET Conference Publications*. CP684 ed. Institution of Engineering and Technology, Vol. 2016.

Electrical Machine Design with Directly Cooled Laminated Fractional Pitch Windings

Reinap, A., Högmark, C., Frogner, K., Lundström, F., Andersson, M., Alaküla, M. & Wang, L., 2015, [*Host publication title missing*].

Predictive monitoring of turn-on-turn insulation in single tooth coils

Huang, Z., Reinap, A. & Alaküla, M., 2015, *2015 IEEE 10th International Symposium on Diagnostics for Electrical Machines, Power Electronics and Drives (SDEMPED)*. IEEE - Institute of Electrical and Electronics Engineers Inc., 15582376

Heat transfer analysis of a traction machine with directly cooled laminated windings

Reinap, A., Márquez-Fernández, F. J., Andersson, R., Högmark, C., Alaküla, M. & Göransson, A., 2014 Dec 12, *2014 4th International Electric Drives Production Conference, EDPC 2014 - Proceedings*. IEEE - Institute of Electrical and Electronics Engineers Inc., 6984395

Cost estimation of electric traction machine and gearbox for a hybrid vehicle application

Domingues, G., Reinap, A. & Alaküla, M., 2014 Sept 30, *2014 4th International on Electric Drives Production Conference (EDPC)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 282-286 5 p.

Consistency analysis of torque measurements performed on a PMSM using dynamic testing

Hall, S., Loayza Vargas, Y., Reinap, A. & Alaküla, M., 2014, *2014 International Conference on Electrical Machines (ICEM)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 1529-1535

Dynamic Testing Characterization of a HEV Traction Motor

Marquez, F., Hall, S. & Alaküla, M., 2014, *2014 International Conference on Electrical Machines (ICEM)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 1569-1575

Dynamic Thermal Modeling and Application of Electrical Machine in Hybrid Drives

Huang, Z., Marquez, F., Loayza Vargas, Y., Reinap, A. & Alaküla, M., 2014, *2014 International Conference on Electrical Machines (ICEM)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2158-2164

FPGA implementation of a Deadbeat Direct Torque and Flux Control Scheme for Induction Machines

Domingues, G., Marquez, F. & Alaküla, M., 2014, *2014 International Conference on Electrical Machines (ICEM)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 776-782

Inductive Analysis of a Multiconductor System Prototype

Abdallah, F. & Alaküla, M., 2014, *2014 International Symposium on Electromagnetic Compatibility (EMC Europe)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 1170-1175

Inductive coupling matrix of a multiconductor system for a winding-on-core prototype

Abdallah, F. & Alaküla, M., 2014, (Submitted).

Performance Estimation of Hybrid Excited Machine with Alternating Pole Configuration

Reinap, A., Alaküla, M., Hall, S. & Estenlund, S., 2014, *2014 International Conference on Electrical Machines (ICEM)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2638-2643

An Integrated 20-kW Motor Drive and Isolated Battery Charger for Plug-In Vehicles

Hagbin, S., Khan, K., Zhao, S., Alaküla, M., Lundmark, S. & Carlson, O., 2013, In: *IEEE Transactions on Power Electronics*. 28, 8, p. 4013-4029

Capacitively coupled transmission line model and validation of a winding-on-core prototype

Abdallah, F. & Alaküla, M., 2013, *IEEE Explore abstract*. p. 987-992

Grid-Connected Integrated Battery Chargers in Vehicle Applications: Review and New Solution

Hagbin, S., Lundmark, S., Alaküla, M. & Carlson, O., 2013, In: *IEEE Transactions on Industrial Electronics*. 60, 2, p. 459-473

Alternative production process for electric machine windings

Siesing, L., Frogner, K., Reinap, A., Högmark, C., Alaküla, M. & Andersson, M., 2012, *2012 2nd International Electric Drive Production Conference (EDPC)*. Hahn, I. (ed.). IEEE - Institute of Electrical and Electronics Engineers Inc., p. 161-167

Characterization and application of forced cooling channels for traction motors in HEVs

Huang, Z., Marquez, F., Alaküla, M. & Yuan, J., 2012, *Proceedings, 2012 XXth International Conference... by Institute of Electrical and Electronics Engineers. Proceedings, 2012 XXth International Conference on Electrical Machines : Palais des Congrès et des Expositions de Marseille, Marseille, France, 02-05 September, 2012*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 1212-1218

Design and evaluation of electrical machine for parallel hybrid drive for heavy vehicles

Andersson, R., Reinap, A. & Alaküla, M., 2012, *XXth International Conference on Electrical Machines (ICEM), 2012*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2622-2628

Design and evaluation of moulded powder-core machine for in-wheel drive application

Reinap, A., Siesing, L., Alaküla, M. & Andersson, M., 2012, *XXth International Conference on Electrical Machines (ICEM), 2012*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2629-2634

Design and experimental evaluation of a compact hybrid excitation claw-pole rotor

Hagstedt, D., Reinap, A., Ottosson, J. & Alaküla, M., 2012, *XXth International Conference on Electrical Machines (ICEM), 2012*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2896-2901

Direct oil cooling of traction motors in hybrid drives

Huang, Z., Nategh, S., Alaküla, M., Lassila, V. & Yuan, J., 2012, *2012 IEEE International Electric Vehicle Conference (IEVC 2012)*. p. 43 8 p.

Electrical machines with laminated winding for hybrid vehicle application

Högmark, C., Andersson, R., Reinap, A. & Alaküla, M., 2012, *2nd International Electric Drives Production Conference (EDPC)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 36-41

Impact of soft magnetic material on construction of radial flux electrical machines

Reinap, A. & Alaküla, M., 2012, In: *IEEE Transactions on Magnetics*. 48, 4, p. 1613-1616

Laminated winding with rapid cooling capability for electrical machines

Högmark, C., Reinap, A., Frogner, K. & Alaküla, M., 2012.

Modular three-phase machines with laminated winding for hybrid vehicle application

Andersson, R., Högmark, C., Reinap, A. & Alaküla, M., 2012, *2nd International on Electric Drives Production Conference (EDPC)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 318-324

New manufacturing methods for electric motors using different soft magnetic material combinations

Siesing, L., Reinap, A., Andersson, M. & Alaküla, M., 2012, [*Host publication title missing*]. Hahn, I. (ed.). IEEE - Institute of Electrical and Electronics Engineers Inc., p. 366-372

On increasing fuel efficiency by operator assistant systems in a wheel loader

Frank, B., Skogh, L., Filla, R. & Alaküla, M., 2012, [*Host publication title missing*]. China Machine Press, p. 155-161

On wheel loader fuel efficiency difference due to operator behaviour distribution

Frank, B., Skogh, L. & Alaküla, M., 2012, *Commercial Vehicle Technology 2012*. Shaker Verlag, p. 329-346 17 p.

Redesign of an Electrical Rear Wheel Drive (E-RWD) for a hybrid vehicle in a given drive cycle

Marquez, F., Huang, Z. & Alaküla, M., 2012, *2012 XXth International Conference on Electrical Machines (ICEM 2012)*. p. 2702-2708

Sub-Optimization of a claw-pole structure according to material properties of soft magnetic materials

Reinap, A., Hagstedt, D., Högmark, C. & Alaküla, M., 2012, In: *IEEE Transactions on Magnetics*. 48, 4, p. 1681-1684

An Isolated High-Power Integrated Charger in Electrified-Vehicle Applications

Hagbin, S., Lundmark, S., Alaküla, M. & Carlson, O., 2011, In: *IEEE Transactions on Vehicular Technology*. 60, 9, p. 4115-4126

Dynamic Evaluation of the Overloading Potential of a Convection Cooled Permanent Magnet Synchronous Motor

Marquez, F., Reinap, A., Huang, Z. & Alaküla, M., 2011, *2011 IEEE International Electric Machines&Drives Conference (IEMDC)*. p. 13-18 6 p.

Electro-thermal Simulations of a Power Electronic Inverter for a Hybrid Car

Ottosson, J., Alaküla, M. & Hagstedt, D., 2011, *Electric Machines & Drives Conference (IEMDC), 2011 IEEE International*. p. 1619-1624

Evaluation of a Semi Claw-Pole Machine with SM2C Core

Reinap, A., Hagstedt, D., Högmark, C. & Alaküla, M., 2011, *2011 IEEE International Electric Machines&Drives Conference (IEMDC)*. p. 248-253

Performance and efficiency evaluation of FPGA controlled IPMSM under dynamic loading

Loayza Vargas, Y., Reinap, A. & Alaküla, M., 2011, *IEEE International Symposium on Diagnostics for Electric Machines, Power Electronics & Drives (SDEMPED), 2011 : 5 - 8 Sept. 2011, Bologna, Italy*. p. 550-555 6 p.

An integrated design of SM2C core motor for vehicular applications

Reinap, A., Högmark, C., Alaküla, M., Cedell, T. & Andersson, M., 2010, *ICEM: 2010 International Conference on Electrical Machines*.

Design, optimization and construction of an electric motor for an Electric Rear Wheel Drive Unit application for a Hybrid Passenger Car

Marquez, F., Reinap, A. & Alaküla, M., 2010, *ICEM 2010. 19th International Conference on Electrical Machines, 2010*.

Prototype based study of different winding configurations with SM2C core

Reinap, A., Högmark, C., Alaküla, M., Cedell, T. & Andersson, M., 2010, *ICEM 2010. 19th International Conference on Electrical Machines, 2010*.

Towards manufacturing of perfect magnets

Frogner, K., Andersson, M., Cedell, T., Kirkhorn, L., Alaküla, M., Reinap, A., Darge, G. & Karlsson, P., 2010, *Proceeding of the conference on Flexible Automation and Intelligent Manufacturing, FAIM2010*. Frogner, K. (ed.).

A comparison between PMSM, EMSM and SMSM in a BAS application

Hagstedt, D., Marquez, F. & Alaküla, M., 2009, *Proceedings of the 2008 International Conference on Electrical Machines, ICEM'08*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2034-2038 4800194

An integrated design of a machine with soft magnetic mouldable composite

Reinap, A., Alaküla, M., Lindstedt, G., Thuresson, B., Cedell, T., Andersson, M. & Jeppsson, P., 2009, *ICEM: 2008 International Conference on Electrical Machines, vols 1- 4*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2288-2292

Design and prototyping a torus machine with a rotocast core

Reinap, A., Högmark, C., Alaküla, M., Cedell, T., Andersson, M. & Jeppsson, P., 2009, *ICEM 2008. 18th International Conference on Electrical Machines, 2008*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2298-2302

Development of a radial flux machine design environment

Reinap, A., Hagstedt, D., Marquez, F., Loayza Vargas, Y. & Alaküla, M., 2009, *ICEM: 2008 International Conference on Electrical Machines, vols 1- 4*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2039-2042

Evaluation of soft magnetic mouldable composite core motors

Reinap, A., Alaküla, M., Cedell, T., Andersson, M. & Jeppsson, P., 2009, *ICEM 2008. 18th International Conference on Electrical Machines, 2008*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 2293-2297

New advances in soft magnetic materials - properties of moulded flux conductors in inductors and electrical motors

Cedell, T., Jeppsson, P., Andersson, M., Ståhl, J.-E., Högmark, C., Reinap, A. & Alaküla, M., 2009.

Development of a radial flux machine design environment

Reinap, A., Hagstedt, D., Márquez, F., Loayza, Y. & Alaküla, M., 2008, *Proceedings of the 2008 International Conference on Electrical Machines, ICEM'08*. 4800195. (Proceedings of the 2008 International Conference on Electrical Machines, ICEM'08).

Prediction of Parasitic Components in an Automotive Environment

Alexandersson, S., Alaküla, M. & Bångtsson, H., 2008, *IEEE International Symposium on Electromagnetic Compatibility Vol 1-3*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 188-194

Rotocast - a new method to produce optimally packed SMC components

Jeppsson, P., Andersson, M., Cedell, T., Alaküla, M. & Reinap, A., 2008, (Unpublished).

Injection moulding of magnetic flux conductors based on soft magnetic composites

Jeppsson, P., Cedell, T., Andersson, M., Alaküla, M. & Reinap, A., 2007, (Unpublished).

A BAS application of a series magnetized synchronous machine

Hagstedt, D. & Alaküla, M., 2006, (Unpublished).

A compact field weakening controller implementation

Ottosson, J. & Alaküla, M., 2006, *International Symposium on Power Electronics, Electrical Drives, Automation and Motion, 2006. SPEEDAM 2006*. IEEE - Institute of Electrical and Electronics Engineers Inc., Vol. 2006. p. 696-700

Automotive power electronic future - from an EMC perspective

Alexandersson, S. & Alaküla, M., 2006, *2006 International Symposium on Power Electronics, Electrical Drives, Automation and Motion*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 609-613

Comparison between three iron-powder topologies of electrically magnetized synchronous machines

Martinez-Munoz, D., Reinap, A. & Alaküla, M., 2006, *Recent Developments of Electrical Drives. Best papers from the International Conference on Electrical Machines ICEM'04*. Springer, p. 335-347

Comparison between three iron-powder topologies of electrically magnetized synchronous machines

Martínez-Muñoz, D., Reinap, A. & Alaküla, M., 2006, *Recent Developments of Electrical Drives. Best papers from the International Conference on Electrical Machines ICEM'04*. Springer, p. 335-347

Design of plastic bonded iron powder core motors

Reinap, A. & Alaküla, M., 2006. 6 p.

Modeling and presentation of the series magnetized synchronous machine

Bergh, T., Hagstedt, D., Alaküla, M. & Karlsson, P., 2006, *International Symposium on Power Electronics, Electrical Drives, Automation and Motion, 2006. SPEEDAM 2006*. IEEE - Institute of Electrical and Electronics Engineers Inc., Vol. 2006. p. 463-468

Simulation and experimentation of a single-phase claw-pole motor

Reinap, A., Alaküla, M., Nord, G. & Hultman, L., 2006, In: *Compel*. 25, 2, p. 379-388

Grundläggande Elektroteknik

Johansson, J., Alaküla, M., Lindstedt, G. & Simonsson, B., 2005, KFS AB. 391 p.

Alternatives for leakage reduction in a novel claw-pole electrically magnetized synchronous machine

Martinez-Munoz, D. & Alaküla, M., 2004, *IEE Conference Publication*. Institution of Electrical Engineers, Vol. 1. p. 386-391

A MEC network method based on the BH curve linearisation: study of a claw-pole machine

Martinez-Munoz, D. & Alaküla, M., 2004, *16th International Conference on Electrical Machines. Conference Proceedings*. Institute of Mechatronics and Information Systems, 6 p.

A resonant galvanically separated power MOSFET/IGBT gate driver

Bergh, T., Karlsson, P. & Alaküla, M., 2004, *2004 IEEE 35th Annual Power Electronics Specialists Conference*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 3243-3247

Comparison between four topologies of synchronous machines using SMC

Martínez-Muñoz, D., Reinap, A. & Alaküla, M., 2004, [*Host publication title missing*]. UK Magnetics Society, 7 p.

Electromagnetic Compatibility Problems in Automotive Applications

Marksell, S. & Alaküla, M., 2004.

Hybrid Drive Systems for Vehicles - Part 1

Alaküla, M., Jonasson, K., Andersson, C., Simonsson, B. & Marksell, S., 2004, Department of Industrial Electrical Engineering and Automation, Lund Institute of Technology.

Iron loss calculation in a claw-pole structure

Reinap, A., Martínez-Muñoz, D. & Alaküla, M., 2004. 5 p.

Simulation and experimentation of a single-phase claw-pole motor

Reinap, A., Alaküla, M., Nord, G. & Hultman, L. O., 2004, *16th International Conference on Electrical Machines. Conference Proceedings*. Institute of Mechatronics and Information Systems, 5 p.

Simulation and experimentation of a two-phase claw-pole motor

Reinap, A. & Alaküla, M., 2004, *16th International Conference on Electrical Machines. Conference Proceedings*. Institute of Mechatronics and Information Systems, 4 p.

A study of the acoustical properties of stators with an outer-surface layer of air gaps

Martínez-Muñoz, D., Lai, J. C. S. & Alaküla, M., 2003. 10 p.

Comparative Study of Petrol- and Diesel Hybrid Topologies vs Directly Diesel Driven Vehicle

Jonasson, K., Alaküla, M. & Egnell, R., 2003.

Comparison between a novel claw-pole electrically magnetized synchronous machine without slip-rings and a permanent magnet machine

Martinez, D. & Alaküla, M., 2003, *IEMDC'03. IEEE International Electric Machines and Drives Conference (Cat. No.03EX679)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 1351-1356

Power Generation - a New Students Entrance to Power Electronics Education

Gertmar, L., Samuelsson, O., Alaküla, M. & Marksell, S., 2003.

Real life testing of a hybrid PEM fuel cell bus

Folkesson, A., Andersson, C., Alvfors, P., Alaküla, M. & Overgaard, L., 2003, In: *Journal of Power Sources*. 118, 1-2, p. 349-357

Study of a three-phase claw-to-claw pole machine

Reinap, A. & Alaküla, M., 2003, *IEMDC'03. IEEE International Electric Machines and Drives Conference (Cat. No.03EX679)*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 325-329

Design of a claw-pole motor

Reinap, A. & Alaküla, M., 2002, *ICEM 2002. 15th International Conference on Electrical Machines*. Institute of Mechatronics and Information Systems, 5 p.

Comparative Study of Generic Hybrid Topologies

Jonasson, K., Strand, P. & Alaküla, M., 2001.

Design and Implementation of a Quasi-Resonant DC Link Converter

Karlsson, P., Bojrup, M., Alaküla, M. & Gertmar, L., 2001, *EPE 2001 Conference Proceedings*. EPE Association, 10 p.

A Simulation Model comparing two different Hybrid Electric Busses

Andersson, C. & Alaküla, M., 2000.

En enkel planetväxel i en vindkraftapplikation med två generatorer

MacLennan, L., Vedmar, L., Svensson, J., Karlsson, P. & Alaküla, M., 2000, Institutionen för Maskinteknologi samt IEA. (Technical report)

Simulation and verification of a Hybrid Bus

Andersson, C., Jonasson, K., Strandh, P. & Alaküla, M., 2000, *Proceedings of the 2000 IEEE Nordic workshop on power and industrial electronics, Aalborg (Denmark), 13-16 Jun 2000*. p. 37-41

Zero Voltage Switching Converters

Karlsson, P., Bojrup, M., Alaküla, M. & Gertmar, L., 2000, *NORPIE 2000 Conference Proceedings*. EPE Association, 5 p.

A drive system for acoustical analysis

Martinez-Munoz, D., Pulle, D. W. J., Alaküla, M. & Weibull, H., 1999, *Electrical Machines and Drives, 1999. Ninth International Conference on (Conf. Publ. No. 468)*. p. 147-150

A Matlab/Simulink Simulation Model of a Hybrid Electric Bus

Andersson, C. & Alaküla, M., 1999.

Modular Vector Drive System: Implications for Magnetic Motor Design

Lesage, P., Pulle, D. W. J., Alaküla, M. & Gertmar, L., 1999.

Multiple Rotating Integrator Controller for Active Filters

Bojrup, M., Karlsson, P., Alaküla, M. & Gertmar, L., 1999, *EPE 99 Conference Proceedings*. EPE Association

On Output Capacitor Size in Boost-Type Power-Converters with Constant Power

Carlsson, A., Alaküla, M. & Gertmar, L., 1999.

Optimization of a servo motor for an industrial robot application

Andersson, S., Alaküla, M. & Lejonberg, T., 1999.

A Dual Purpose battery Charger for Electric Vehicles

Bojrup, M., Karlsson, P., Simonsson, B. & Alaküla, M., 1998, *PESC 98 Conference Proceedings*. IEEE - Institute of Electrical and Electronics Engineers Inc., p. 565-570 6 p.

Control of a split pole pair induction machine

Lesage, P., Alaküla, M., Pulle, D. W. J. & Gertmar, L., 1998, *Power Electronics and Variable Speed Drives, 1998. Seventh International Conference on (Conf. Publ. No. 456)*. p. 447-450

A 40 kW switched reluctance engine starter/generator system for an electric hybrid vehicle

Alaküla, M., Sjöberg, L. & Johansson, P., 1997, p. 717-720.

Control and Design Interaction in Hybrid Electric Vehicles - Benefits of Using Power Electronics

Hemmingsson, M., Simonsson, B., Alaküla, M. & Olsson, G., 1997, *7th European conference on power electronics and applications*. Vol. 1. p. 556-569

Efficiency of Off-Board, High Power, Electric Vehicle Battery Chargers with Active Power line Conditioning Capabilities

Karlsson, P., Bojrup, M., Alaküla, M. & Gertmar, L., 1997, *EPE 97 Conference Proceedings*. EPE Association, p. 4688-4692 5 p.

Random modulation of line commutated power converters

Alaküla, M., Sjöberg, L. & Johansson, P., 1997, [*Host publication title missing*]. Vol. 1. p. 279-280

The dynamic thermal loading of an induction machine

Lesage, P., Alaküla, M. & Gertmar, L., 1997, [*Host publication title missing*]. Vol. 2. p. 520-525

EHC-Electric Hybrid Vehicle Centre at LTH

Alaküla, M. & Olsson, G., 1996, [*Publisher information missing*].

Awards

CONVERGE II - En lösning för energidistributionen inom vägbyggnation & bergtäkt

Alaküla, M. (PI)

Swedish Energy Agency: SEK2,089,578.00

2024/05/06 → 2027/12/17

Projects

Charging Infrastructure for light and heavy vehicles in Sweden

Alaküla, M. (Researcher)

2021/07/01 → 2024/06/30

CONVERGE - En lösning för energidistributionen inom vägbyggnation

Alaküla, M. (PI)

Swedish Government Agency for Innovation Systems (Vinnova)

2023/03/06 → 2023/09/06

DANE: Direkt kylning Av aluminium liNdade Elmaskiner

Alaküla, M. (PI)

Swedish Energy Agency

2024/01/01 → 2026/12/31

Effektiva och robusta elmaskiner och reglersystem för integration i jetmotorer

Alaküla, M. (PI)

Swedish Government Agency for Innovation Systems (Vinnova)

2024/06/11 → 2028/06/14

Electric Farm - Steg 2

Alaküla, M. (Researcher)

2019/10/01 → 2023/06/30

EPOS: Electric Powertrain Optimisation for Vehicles and Fleets

Alaküla, M. (Researcher)

2020/04/20 → 2023/05/03

Elvägssystem för Materialhanteringsfordon - Konseptutstudie med Elonroad och Kalmar

Alaküla, M. (PI)

Swedish Energy Agency

2023/12/01 → 2025/06/30

Evolution Road

Alaküla, M. (Researcher), Wenander, D. (Research student) & Abrahamsson, P. (Researcher)

2019/08/01 → 2024/12/31

Framtidens depåladdningskoncept - För en skalbar och snabb omställning av transportsektorn

Alaküla, M. (PI)

Swedish Government Agency for Innovation Systems (Vinnova)

2022/04/01 → 2025/04/01

SHORTS: Säkra, hållbara och resilienta transportsystem

Alaküla, M. (PI)

Swedish Energy Agency

2024/04/01 → 2028/04/01

TED: Terminalladdning av Elektriska Distributionsfordon

Alaküla, M. (Researcher)

2021/04/01 → 2023/06/30

TEEM: Tillverknings effekter i elektriska maskiner

Alaküla, M. (Researcher)

2020/08/01 → 2024/03/31