



Lecture Title	Presenter
A Holistic Approach to Traction Motor Design	Professor Alecksey Anuchin
A medium voltage frequency converter: operating principle and applications	Senior Researcher Yulia Kazemirova

时间： 3月30日 14:30-16:00

地点： 经管学院B117报告厅

Professor Alecksey Anuchin Moscow Power Engineering Institute 莫斯科动力学院



Alecksey Anuchin (Senior Member, IEEE) received the B.Sc., M.Sc., Ph.D., and Dr.Eng.Sc. degrees from Moscow Power Engineering Institute, Moscow, Russia, in 1999, 2001, 2004, and 2018, respectively.

He is the Chair of Joint Chapter IE13/PE31/PEL35/IA34, Moscow, from 2021. He is in a head position at the Department of Electric Drives, Moscow Power Engineering Institute for the last ten years. He has more than 25 years of experience covering control systems of electric drives, hybrid powertrains, and real-time communications. He is the author of three textbooks on the design of real-time software for the microcontroller of the C28 family and Cortex-M4F, and control system of electric drives, in Russian. He has published more than 200 conference papers and journal articles. He delivers lectures on “Control Systems of Electric Drives,” “Real-time Software Design,” “Electric Drives,” and “Science Research Writing” in Moscow Power Engineering Institute.



标题

A Holistic Approach to Traction Motor Design

时间地点

经管学院B117报告厅 3月30日 14:30至15:10

内容简介

Electric traction is becoming more and more popular. In railways induction motors are standard while interior permanent magnet motors are dominating in hybrid and pure electric vehicles. However, many questions have been raised over the last decade about how to reduce dependence on permanent magnets or how to improve traction parameters. Kamatsu and Turntide claim that switched reluctance machines can be used in traction, BMW and Renault implement traction drives with the help of DC excited synchronous motor. Audi and Tesla rely on induction machines. This presentation deals with an experience on the implementation of a powertrain for a 90-ton mining truck based on Synchronous Homopolar Motor and the questions raised after implementation and its exploitations. The approach for holistic optimization of the traction motor design considering inverter installed capacity will be presented. The detailed comparison of induction motor, interior permanent magnet synchronous motor, DC-excited synchronous motor, and switched reluctance motor for the wide constant power range traction drive will be provided.

Senior Researcher Yulia Kazemirova Moscow Power Engineering Institute 莫斯科动力学院



Yulia Kazemirova received Ph.D. degree from Moscow Power Engineering Institute in 2023. Since 2020 she works at the Electric Drives Department, Moscow Power Engineering Institute, as a senior researcher. The field of her scientific interests cover power electronics, motor control. Recent research is related to the development of control system for medium voltage frequency converters.

She is also in the position of leading software engineer of R&D Company “Vector” LLC.



标题

A medium voltage frequency converter: operating principle and applications

时间地点

经管学院B117报告厅 3月30日 15:20至16:00

内容简介

Medium voltage frequency converters generally utilize low-voltage multi-cell topology. The cascaded connection between their cells allows them to multiply effective pulse-width modulation (PWM) frequency by the number of cells. However, available PWM techniques have some limitations, such as time delayed operation which limits current loop response time, need for reinitialization of the PWM carriers in case of cell failure, or the unequal distribution of losses. This presentation deals with a PWM strategy that operates in the case of partial inverter failures, provides the maximum available voltage to the load, and has a low response time due to a single cell operating at a high PWM frequency while the average switching frequency is limited. It also considers the testing conditions for this type of converter. In addition, different applications are considered, including system with switched reluctance motor.

联系人及承办单位



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