中国矿业大学越崎引智计划讲座

Multilevel Neutral-point-clamped Converters – From the Fundamentals to Advanced PWM Strategies

讲座专家：Professor Sergio Busquets Monge

时间：　4月19日 19:00-21:30

4月22日 19:00-21:30

地点：文昌校区逸夫楼合2教室

中国矿业大学越崎引智计划讲座—Professor Sergio Busquets Monge

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Research Interests

- Modular and scalable power converter design
- Multilevel power conversion
- Electric vehicles

Sergio 教授将针对中性点钳位型多电平变换器做2场专题报告

Brief introduction for the tutorial series:

Multilevel neutral-point-clamped converters – From the fundamentals to advanced PWM strategies

- **Power electronics** is a fundamental technology in several areas, and particularly in industrial systems. Advances in power electronics will play a fundamental role in achieving the technological objectives that society pursues in terms of energy and sustainable transport.
- **Multilevel NPC converter topologies** enable a simple modular and scalable design of all types of power converters (dc-dc, dc-ac, ac-ac), with higher power density, improved performance features (efficiency, harmonic distortion, common-mode voltage…), and system-level benefits, compared to conventional systems.
- Despite for a long time the operation of these converters was deemed unfeasible for a wide operating range, we now know **how to properly control them**.
- The use of multilevel NPC converters is widely spreading through many applications, and **it is important to learn the basics** of this technology.

Part I

标题	Multilevel Neutral-Point-Clamped Converters – From the Fundamentals to Advanced PWM Strategies
时间地点	文昌校区逸夫楼合2教室 4月19日 19:00至21:30
涵盖内容	Chapter 1: Introduction to NPC Power Conversion Chapter 2: Virtual Vector Modulation
内容简介	The first lecture will initially cover an introduction to NPC power converters: definition through a functional diagram, the different leg topologies of the NPC family, the leg switching states, the converter switching states and the associated space vector diagram, basic control strategies, the dc-link capacitor voltage balance issue, and typical applications. Subsequently, virtual vector modulations, which guarantee capacitor voltage balance in all operating conditions, will be presented for the three-level dc-ac conversion case, with any number of ac phases.

Part II

标题	Multilevel Neutral-Point-Clamped Converters – From the Fundamentals to Advanced PWM Strategies
时间地点	文昌校区逸夫楼合2教室 4月22日 19:00至21:30
涵盖内容	Chapter 2: Virtual Vector Modulation (continued) Chapter 3: Application Examples
内容简介	The second lecture will begin presenting the extension to any number of levels of the virtual vector modulation for dc-ac conversion systems. Subsequently, alternative PWMs also guaranteeing capacitor voltage balance will be discussed. The presentation of suitable modulation strategies to operate multilevel NPC dc-dc converters will conclude Chapter 2. Finally, in Chapter 3, the advantages of this technology will be illustrated through some application examples: motor drive, electric vehicle traction inverter, and photovoltaic inverter.

联系人及承办单位

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