2021 IEEE Industrial Electronics and Applications Conference (IEACon 2021)

Virtual Conference
22 – 23 November 2021

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11:15-12:15	KEYNOTE 2 (Professor Dr. Sewan Choi - Seoul National University of Science and Technology, Korea): *High power density, high efficiency on-board battery chargers for electric vehicles*	
12:15-12:30	*Announcement of the Best Paper Award*	
12:00-14:30	*BREAK*	
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08:30-10:30	A21: *Power Electronics 2*	B21: *Electrical Machines and Drives*
10:30-12:30	A22: *Power Electronics 3*	B22: *Sensors, Actuators and Micro-Nanotechnology / Renewable Energy / Power Systems and Smart Grids*
12:30-14:30	*BREAK*	
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16:30-18:10	A24: *Signal and Image Processing and Computational Intelligence*	B24: *Electronic Systems on Chip and Embedded Control / Industrial Automation, Communication, Networking and Informatics / Industrial Electronics and Education*

Monday, November 22, 2021

Session	: Keynote 1
Title	: Integration technology of electric machines and inverter system in EV
Presenter	: Professor Dr. Kan Akatsu (Yokohama National University, Japan)
Time	: 10:15 - 11:15
Room	: Online via CISCO WEBEX
Chair	: Professor Dr. Mohd Amran Mohd Radzi (Universiti Putra Malaysia, Malaysia)

SYNOPSIS

Recent EV development is requesting further high efficiency, high power density, and high torque density electric machine. From this trend, E-Axle that integrates the electric machine, the inverter, and the reduction gear becomes more popular. To investigate further development in the integration system in EV, I introduce multi-phase machine and multi-phase drive technique by using SiC-MOS-FET to satisfy the fault tolerant system in EV. I integrated this system in 16-inch in-wheel motor, the basic characteristics of the system is introduced in the speech. Also further technique to achieve high efficiency, high torque density, and less acoustic noise will be introduced.

Session	: Keynote 2
Title	: High power density, high efficiency on-board battery chargers for electric vehicles
Presenter	: Professor Dr. Sewan Choi (Seoul National University of Science and Technology, Korea)
Time	: 11:15 - 12:15
Room	: Online via CISCO WEBEX
Chair	: Professor Dr. Mohd Amran Mohd Radzi (Universiti Putra Malaysia, Malaysia)

SYNOPSIS

Recently, major automobile companies set ambitious EV development roadmaps, and EV chargers that are compatible with both the single-phase and three-phase grids are gaining more attention. According to 2025 DoE roadmap, the power density and efficiency targets for the EV on board charger are challengeable, which requires 4 kW/kg and 4.6 kW/L with efficiency of 98%. In the meanwhile, owing to lower operating cost, EVs are more suitable for mobility-as-a-service applications such as connected-taxi and car-share. This kind of vehicles requires operating time of 50,000 to 80,000 miles a year which is three to four times higher than that of the private passenger vehicles, meaning that high durability is a key performance. In response to this concern, the life expectancy target for 2025 was increased from 150,000 to 300,000 miles. In this talk, general overview of the state-of-the-art OBC technologies along with their technical challenges and issues are discussed. A single-stage E-capless battery charger is introduced, and recent research results on high power density, high efficiency E-capless single-stage EV chargers will be presented.

12:15 - 12:30 : Announcement of the Best Paper Award

12:30 - 14:30 : Break

Monday, November 22, 2021

Time : 14:30 - 16:30
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Room : Virtual Room A

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15:30   *Modeling and Analysis of High Frequency Magnetic Link-Based 11 kV Asymmetric 21 Level Inverter for Solar Photovoltaic Systems...50*
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Tuesday, November 23, 2021

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9:10   *Small Signal Model of the Three-Phase AC-DC Current Injection Hybrid Resonant Converter...113*
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9:30   *Simplified Power Estimation Feedforward to Reduce DC-Link Capacitance in Single-Phase Dual-Stage Full-Bridge Microinverter...119*
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Time : 16:30 - 18:10
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