



綠能電子國際論壇

International Forum on Green Energy Electronics

Time/Date: 09:00-12:00, June 21, 2019

Location: IB 302, International Building, NTUST, Taipei, Taiwan

國立臺灣科技大學國際大樓會議室 IB302

Sponsored by

台科大國際產學聯盟

科技部先進電源產學技術聯盟

台科大電力電子技術研發中心

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科技部先進電源產學技術聯盟



Agenda

International Forum on Green Energy Electronics		
2019.06.21 (Fri.) 報到: 08:30~09:00 (台灣科技大學國際大樓 IB 302)		
場次/時間	內 容	貴賓/人員
09:00~09:10	講員介紹	Prof. Huang-Jen Chiu 台灣科技大學特聘教授兼產學長 電力電子技研中心主任
09:10~10:20	Invited Talk (A) Extremely High Efficiency Converter/ Inverter with Emerging Wide Bandgap Semiconductor Devices	Prof. Hideaki Fujita 東京工業大學電機系教授 主持人：台科大電力電子技研中心張佑丞博士
10:20~10:50	Coffee Break	
10:50~12:00	Invited Talk (B) Missing Current-Source Converters for Multiple Output Applications and More	Prof. Michael C. K. Tse 香港理工大學電子系講座教授 IEEE Fellow 主持人：台科大電力電子技研中心張佑丞博士
12:00~13:30	Lunch (蘇杭)	

Missing Current-Source Converters for Multiple Output Applications and More

Prof. Michael C. K. Tse, IEEE Fellow
Chair Prof., Hong-Kong Polytechnic University

Abstract: Conventional DC-DC converters are voltage based, in the sense that they convert a voltage to another voltage with a control parameter, normally the duty cycle. With the recent emergence of solid-state loads, appropriate topologies for power conversion may fall outside the conventional set of voltage-based converters. In this talk we explore current-source based converters which are rarely studied and apparently missing from the usual available set of topologies. We will discuss the applications of these missing converters in multi-output power supplies by examining all possible structures systematically and comparing with existing converter configurations.

Brief Bio of Prof. Michael C. K. Tse

C. K. Michael Tse obtained the BEng(Hons) and PhD degrees from the University of Melbourne, Australia, in 1987 and 1991, respectively. Presently, he is Chair Professor of Electronic Engineering with the Hong Kong Polytechnic University, and from 2005 to 2012 he was Head of its Department of Electronic and Information Engineering. His research interests include power electronics, nonlinear systems, and network applications. In 2005 he was elected IEEE Fellow, and in 2009 he was appointed Chang Jiang Scholars Chair Professor by the Ministry of Education of China. Prof. Tse received numerous research and invention prizes including IEEE Transactions Paper Prizes and Gold Medals in international invention expos, was conferred honorary professorships by a few Australian and Chinese universities, and was awarded distinguished fellowships by a few Australian and Canadian universities. He serves/has served as Editor-in-Chief for IEEE Transactions on Circuits and Systems II, IEEE Circuits and Systems Magazine, as Editor for a few other journals, and as member of a few IEEE institute-level committees. Locally, he serves/has served on panels of ITF, RGC and ITC-ESS and on Quality Education Fund Committee of HKSAR Government, and is a broad member of the Hong Kong Sinfonietta.

Extremely High Efficiency Converter/ Inverter with Emerging Wide Bandgap Semiconductor Devices

Prof. Hideaki Fujita

Dept. of Electrical and Electronic Engineering, Tokyo Tech

Abstract: Emerging wide band gap semiconductor devices are expected to achieve an extremely high conversion efficiency in various applications. However, there is a simple question why the efficiency would be improved. This talk will first confirm the dominant factors inducing power losses in conversion circuits, and some bad examples will also be presented. Finally, based on these discussion, two different circuits will be introduced as examples having a successfully-improved efficiency: one is a soft-switching switched capacitor-based resonant converter having a maximum efficiency of 99.8%, and the other is a SiC-MOSFET inverter with 99.7% conversion efficiency operated under hard-switching conditions.

Brief Bio of Prof. Hideaki Fujita

Prof. Hideaki Fujita received the B.S. and M.S. degrees in electrical engineering from Nagaoka university of technology, Nagaoka, Japan in 1988 and 1990, and the Dr. Eng. degree in electrical engineering from Tokyo institute of technology, Tokyo, Japan in 2000. He became a research associate at Okayama university, Okayama, Japan in 1991. He joined Tokyo institute of technology as a associate professor in 2002. He is currently a professor and vice-chair in Department of electrical and electronics engineering. He has engaged with research projects on harmonic compensation for a long time, which include development of active power filters and hybrid power filters, improvement their performance of digital current controllers He has also developed pulse-density modulation (PDM) power control for high-frequency inverters, which has been applied to practical uses of industrial high-frequency induction heaters and induction/discharge plasma generators. He is recently working to develop utility grid connection inverters for solar cells and fuel cells, the aim of which is to improving the power conversion efficiency and to reduce the size of the ac inductors and EMI filters. He has authored or coauthored 110 journal papers including 46 IEEE Transactions papers. He has presented 65 technical papers at international technical conferences sponsored or cosponsored by the IEEE Industry Applications Society and/or the IEEE Power Electronics Society. He has received a society prize paper award from IEEE Industry Applications Society in 2009 and five committee prize paper awards from the IEEE Industry Applications Society Industrial Power Conversion Committee in 1990, 1995, 1998, 2003, and 2016. He is also awarded the technical paper prize from the Institute of Electrical Engineers in Japan in 2008 and 2010. He is the recipient of the 2005 IEEJ IPEC Isao Takahashi Power Electronics Award. From 2007, he is an Associate Editor for the IEEE Transactions on Industry Applications. He was the Chair of the IEEE Industry Applications Society Japan Chapter in 2008 and 2009.



開車

由中山高速公路下圓山交流道，接台北市建國南北高架道路，下辛亥路往木柵方向行駛，於辛亥路二段與基隆路交叉口（台大校園旁）右轉，過長興街後即可到達台灣科大。

由北二高接台北聯絡道，於辛亥路三段與基隆路交叉口左轉，過長興街後即可到達台灣科大。

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