



## SEMINAR

### “Characteristic Mode Analysis of Radiating Structures in Digital Systems”



Prof. Qi Wu  
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at the Institute of Electromagnetic Theory, TUHH,  
Hamburg-Harburg, Germany

*September 10, 2015*  
14,30 ÷ 15,30 – DET Meeting Room  
in front of Classroom no. 12

Politecnico di Torino

#### ABSTRACT

In this talk, we introduce the theory of characteristic mode (TCM) to the analysis of radiating structures in digital systems. This method performs an eigenmode analysis of the structure without considering specified excitations, and obtains a group of eigencurrents and eigenvalues. We show that distributions of the eigencurrents and magnitude of the eigenvalues are the two keys to reduce the radiated emissions of potential radiators. This visualized tool provides some useful hints for the placement of excitation, grounding, and loading. Some representing radiators, including signal traces, connected circuit boards, and metallic heatsinks are analyzed through the TCM, and very positive results are obtained. This method provides a unified tool to analyze different radiators and relies little on personal experiences, which is potentially useful in the analysis and design of digital systems.



Qi Wu received the B.S. degree from East China Normal University, Shanghai, China, and the Ph.D. degree from Shanghai Jiao Tong University, Shanghai, China, both in Electrical Engineering, in 2004 and 2009, respectively. He joined the faculty of the School of Electronics and Information Engineering, Beihang University (BUAA), Beijing, China, in 2009, and now he is an Associate Professor and a supervisor for masteral students.

During 2011 and 2012, he was a Visiting Scholar in the Department of Electrical Engineering, University of California, Los Angeles. Since 2014, he is an Alexander von Humboldt Fellow in the Institute of Electromagnetic Theory, Technical University of Hamburg, Germany. He has authored over 20 journal papers, one book “Planar monopole and dipole antennas: theory and ultrawideband applications (in Chinese)”, and holds four Chinese patents. His research interests include the ultrawideband antennas, computational electromagnetics, and related EMC topics.

Dr. Wu received the Young Scientist Award from the International Union of Radio Science (URSI) in 2011, the Nominee Award for National Excellent Doctoral Dissertation from Minister of Education in 2012, and the Natural Science Award from Shanghai Bureau of Technology in 2013. His paper was selected as the Hot Papers of Microwave and Optical Technology Letters in 2007. He is a member of Editorial Advisory Board for Recent Patents on Telecommunications, and a technical reviewer for several scientific journals.

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