香港城市大學
City University of Hong Kong

Department of Electronic Engineering

State Key Laboratory of Millimeter Waves
毫米波 國家重點實驗室
(香港城市大學伙伴實驗室)
(Partner Laboratory in City University of Hong Kong)

IEEE (HK) Section
AP/MTT

Seminar on

A Novel Meshless Method for Solving Inhomogeneous and Anisotropic Electromagnetic Problems

By

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Abstract

In computational electromagnetics, volume integral equations (VIEs) are indispensable for solving inhomogeneous or anisotropic electromagnetic (EM) problems by integral equation approach. The solution of VIEs strongly relies on the appropriate discretization of volume integral domains, and tetrahedral discretization is usually preferred for arbitrarily-shaped geometries. Unlike discretizing a surface domain, the discretization of a volume domain could be very difficult in practice and special commercial software is needed in general even for a simple and regular geometry. To reduce the cost of descretizing volume domains, especially remove the constraint of mesh conformity required by the traditional method of moments (MoM), we propose a novel meshless method for solving the VIEs recently. The method is based on the transformation of volume integrals into boundary or surface integrals through the Green–Gauss theorem when integral kernels are regularized by excluding a small cylinder or cube enclosing an observation node. The original integral domain represented by the object is also expanded to a cylindrical or cubic domain circumscribing the object to facilitate the evaluation of boundary integrals. The singular integrals over the small cylinder are specially handled with singularity subtraction techniques. Several numerical examples for solving inhomogeneous and anisotropic EM problems are presented to illustrate the method and good results can be observed.

Biography

Mei Song Tong received the BS and MS degrees from Huazhong University of Science and Technology, Wuhan, China, and PhD degree from Arizona State University, Tempe, Arizona, USA, all in Electrical Engineering. He is currently the Distinguished Professor and Head of the Department of Electronic Science and Technology, Tongji University, Shanghai, China. Before he joined Tongji University, he was a Research Scientist at the Center for Computational Electromagnetics and Electromagnetics Laboratory, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, USA. His research interests include computational electromagnetics, antenna theory and technology, design of RF/microwave circuits and devices, interconnect and packaging analysis for chips, inverse scattering for microwave imaging, and multiphysics electromagnetics. He has authored or co-authored more than 150 papers published in refereed journals and conference proceedings, and co-authored a book: *Integral Equation Methods for Electromagnetic Waves*, Morgan & Claypool, San Rafael, CA, 2008.

Prof. Tong is a fellow of Electromagnetics Academy, a senior member of IEEE, a full member (Commission B) of USNC/URSI, and a member of AAAS, ACES, Sigma Xi Society, etc. He has served or is serving as an associate editor or guest editor for several well-known international journals, including *IEEE Transactions on Antennas and Propagation*, *IEEE Transactions on Components, Packaging and Manufacturing Technology*, *Progress in Electromagnetics Research*, *Journal of Electromagnetic Waves and Applications, International Journal of Numerical Modeling: Electronic Networks, Devices and Fields, Waves in Random and Complex Media,* etc. He is also active in many international conferences by serving as a co-chair, session chair, or session organizer. Prof. Tong currently holds a visiting professorship at the University of Illinois at Urbana-Champaign, USA, and Kyoto University, Japan, and an honorary professorship at the University of Hong Kong, China. He won a visiting professorship award from Kyoto University, Kyoto, Japan, and several teaching and research awards in Tongji University, China.

Date	:	**30 April 2014 (Wednesday)**
Time	:	**10:30 a.m. – 11:30 a.m.**
Venue	:	**Room 15-202, Meeting room of State Key Laboratory of Millimeter Waves, 15/F, Academic 3, City University of Hong Kong**

*** *All Are WELCOME* ***

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