Seminar on

Research in the Two Recent Electromagnetics Hot Topics-
Metasurface Scattering and Orbital Angular Momentum Radiation

by

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Abstract

Recently, two topics in electromagnetics become very hot. They are metasurface scattering and the radiation of the vortex waves with Orbital Angular Momentum. By introducing the abrupt phase gradient on a surface, one can modify the conventional reflection and refraction laws of electromagnetic waves and thus control the wave propagation easily. In this report, the research progress in using the geometric phase gradient introduced by rotating the polarization of the sub-scatterers is reported. Both arrays for scattering propagation waves and surface waves are researched and some initial conclusions are obtained. Furthermore, a recently reported H-shape metasurface that can perfectly convert the propagation wave into the surface wave is studied. For the Orbital Angular Momentum research, we calculate the off-axis orbital angular momentum and give out the closed form of the field generated by the off-axis orbital angular momentum. Also, a loop multiport-feed loop antenna is proposed for radiating the orbital angular momentum.

Biography

Haogang Wang, associate professor, supervisor of PHD students in Department of Information Science and Electronic Engineering of Zhejiang University, primarily focused on computational electromagnetics, and its applications on wireless communications, remote sensing, target scattering, radio frequency integrated circuits and nano plasmonic optics. During the PHD studying at Univesrity of Electronic Science and Technology of China, Dr Wang was the first person in China who developed the MLFMA using C++ for fast calculating the scattering from the electric large objects. From 2002 to 2004, he was a Research Assistant in the Wireless Communications Research Center, City University of Hong Kong, Hong Kong, China, where he focused his research in developing high efficiency algorithms used in EM simulation of the parasitic parameters from large scale radio frequency integrated circuits and developed a novel fast integral equation solver called "MultiLevel Green's Function Interpolation Method (MLGFIM)." In April 2004, he joined the EM Academy at Zhejiang University, Hangzhou, China. In April 2005, July 2006, and July 2007 he respectively short-term visited City University of Hong Kong for developing the high efficient full-wave EM algorithm Multi Level Green's Function Interpolation Method (FWMLGFIM). In Zhejiang university, Dr. Wang developed a rigorous numerical model for evaluation of the MIMO wireless channel. From September 2009 to September 2011, as a visiting scholar assigned by Zhejiang University and China scholarship council, he did research on the computational optics for simulating the superlens at University of Washington, Seattle, USA. Dr Wang is a Committee Member of the Chinese Society of Computational Physics, Computational Electromagnetic Group, and the evaluation board member of the National Natural Science Foundation of China. In this year, from June 4 to September 10, Dr. Wang is a senior research fellow in City university of Hong Kong for doing the metasurface related research.

Date : 5 August 2015 (Wednesday)
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Venue : Room 15-202, 15/F, 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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