香港城市大學 City University of Hong Kong

Department of Electronic Engineering

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

IEEE (HK) Section AP/MTT

Seminar on

Microwave Properties of Early-Age Concrete and Mortar Specimens

by

Dr Kwok (Alan) Chung

University of Western Sydney

Abstract

Microwave noninvasive and evaluation techniques have shown to be promising for characterization of cement-based materials (CBMs). In infrastructure engineering and construction industry, determination of initial water-to-cement (w/c) ratio and cure-state monitoring of early-age CBMs are still challenging tasks. In this seminar, measurement results of monitoring of electrical conductance and susceptance at microwave frequencies, and reflection coefficients of early-age concrete and mortar specimens with different w/c ratios and constituent ratios are presented. The comparative measurements are conducted using a well-established microwave near-field noninvasive testing technique at two frequency bands; namely, R-band (1.7 GHz – 2.6 GHz) and X-band (8.2 GHz – 12.4 GHz). Empirical curve fitting have been performed on the temporal behaviors of early-age CBMs. The results demonstrated that the dynamic ranges, the initial values and the initial slopes of measurement curves can be used for cure-state monitoring, hydration rates prediction and initial w/c ratio determination.

Biography

Kwok (Alan) Chung (S'00–M'05–SM'11) received the B.E. degree with first-class honors and the Ph.D. degree in electrical engineering from the University of Technology Sydney (UTS), Australia, in 1999 and 2005, respectively. He joined the Faculty of Engineering, University of Technology Sydney, in 2004 as a Lecturer. In 2006, he joined the Department of Electronic and Information Engineering at the Hong Kong Polytechnic University, where he spent about six years mainly for the contribution of teaching. In 2012, he returned to Sydney and joined the Institute for Infrastructure Engineering, University of Western Sydney (UWS) as a Research Fellow for Infrastructure Health Monitoring. His current research interests include wireless sensors for structure health monitoring, characterization of novel cementitious composites, microwave CP antennas, applications of metamaterial and metasurface, and wireless power harvesting. Dr. Chung was the Vice-chair and Chairman of the IEEE AP/MTT Hong Kong Joint Chapter in 2010 and 2011, respectively.

Date : 1 August, 2014 (Friday)
Time : 03:00 pm – 04:00 pm
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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