



The **Center of Excellence for Airport Technology** is sponsoring this seminar. Everyone is invited to attend.

"Inverse Estimation of Transient Thermal Diffusivity and Heat Generation in Early Age Portland Cement Mortars Using Sparse Sensor Information"

Dr. Wilkins Aquino

The characterization of thermophysical properties in early age Portland cement concrete and mortars is a challenging problem due to the transient nature of the system. That is, properties such as thermal diffusivity, thermal conductivity, and specific heat change in time as concrete or mortar matures. In addition, the direct measurement of these properties is further complicated by internal heat generation due to the exothermic nature of cement hydration. This seminar will present two techniques for estimating transient thermal diffusivity in hydrating mortars and concrete. The first technique uses harmonic thermal signals and the principle of superposition for estimating thermal diffusivity as a function of time. The second technique uses an inverse problem approach for simultaneously estimating heat generation and thermal diffusivity as functions of time. The feasibility of these methodologies is demonstrated through computational and laboratory experiments.

Dr. Wilkins Aquino is an Assistant Professor at Cornell University in the Department of Civil and Environmental Engineering. Aquino joined the Cornell faculty in July 2003. He obtained his BS in Civil Engineering from Purdue University and his MS and PhD from the University of Illinois at Urbana-Champaign. His work at Illinois involved various aspects across the disciplines of structural and materials engineering such as seismic rehabilitation of corroded structures, modeling of heat and mass transport in concrete, studies on the mechanisms of alkali-silica reaction in concrete, and non-linear finite element analysis. Before coming to Cornell, Aquino spent one year working for the Engineering Mechanics and Infrastructure (EMI) Division at Simpson Gumpertz and Heger, Inc in Waltham, MA. In addition, his past experience includes various consulting projects in materials and structural engineering.

12:00 pm, Tuesday, October 3, 2006

Room 1233 NCEL

205 N. Mathews Ave., Urbana