

Systemization of concrete science and technology through multi-scale modeling

Date: July 13rd 2015

**Venue: Tokyo, Toshi Center Hotel, 6 Floor,
Room No.601**

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Objective: Multi-scale view and concept have been a core discipline of concrete engineering on which codes of design for fresh, hardened and structural concrete have been based. Currently, the multi-scale prospect is being linked with coupled chemo-physics, and its scope is rapidly expanding to the gigantic mega-system consisting of structural concrete, soil foundation and global atmospheric circulation. It means that the multi-scale outlook not only systemizes the vast knowledge of concrete, but also may serve as a platform of design, planning and maintenance of concrete structures with respect to safety, durability and sustainability. So, it is a right time to discuss the direction of further development to meet the challenge on socio-human welfare and the way of contribution by concrete engineers. This symposium is held as a part of JCI 50th anniversary ceremonies, in which we look back the past and direct our attention to the next half of the century again.

Tentative Time Table	
8:30-8:40	Opening Address JCI President: Professor Hirozo Mihashi
8:40-10:40	[Session 1: Volume change] (1) Folker H. Wittmann (Professor emeritus, ETH Zurich) <i>Shrinkage and Creep of Concrete: Mechanisms as Described on Different Structural Levels.</i> (2) Shashank Bishnoi (Assistant Professor, IIT Delhi) <i>Modelling creep and autogenous shrinkage in hydrating cement microstructures</i> (3) Miguel Azenha (University of Minho) <i>- Coupling developments of macro-scale testing with parameter estimation for multi-scale modelling: the case study of interaction between EMM-ARM and mic</i>

	<p>(3) Miguel Azenha (University of Minho) - <i>COST Action TU1404 - Towards the next generation of standards for service life of cement-based materials and structures: Opportunities of interaction with JCI in the context of multi-scale modeling</i></p> <p>(4) Ippei Maruyama (Associate Professor, Nagoya University) Understanding of concrete structure: multi-scale observations and modeling</p>
10:40-11:20	Discussion with coffee
11:20-12:20	<< Lunch >>
12:20-13:50	<p>[Session 2: Durability]</p> <p>(5) Kazuo Yamada (National Institute for Environmental Studies) and Hosokawa Yoshifumi (Taiheiyo Cement Corporation) <i>Concrete deterioration modelling by using thermodynamic equilibrium codes.</i></p> <p>(6) Tetsuya Ishida (Professor, The University of Tokyo) <i>Multi-scale and Multi-chemo-physics modeling of structural concrete.</i></p> <p>(7) Hikaru Nakamura (Professor, Nagoya University) <i>Modeling of crack and its impact to structures</i></p>
13:50-14:20	Discussion with coffee
14:20-15:50	<p>[Session 3: Toward generalized-knowledge-based application]</p> <p>(8) Yann Le Pape (Oak Ridge National Laboratory) <i>Modeling of irradiated concrete through upscaling techniques</i></p> <p>(9) Eddie Koenders (Professor, TU Darmstadt) <i>The Multiscale model of things.</i></p> <p>(10) Koichi Maekawa (Professor, The University of Tokyo) <i>Multi-scale modeling for life-cycle infra-management.</i></p>
15:50-16:20	Discussion with coffee
16:20-17:20	Discussion for future
17:20-17:30	Closing Address Professor Koichi Maekawa