

Invited Lecture
Seoul National University
Dept. of Architecture &
Architectural Engineering

Models for Nonlinear Analysis of Concrete Structures

Dept. of Architecture & Architectural Engineering
Seoul National University, Korea
Room #429, Building #38 (GECE)
October 2nd, 2019 (Weds) 4:00 PM ~ 4:50 PM



Invited Speaker

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Abstract

A modern engineer designs beautiful and challenging structures, where the classical design methods are often extended far beyond their originally envisioned application domain. Also new materials or construction technologies are appearing almost every day, while the necessary design standards take many years to develop and to mature. Engineers verify and check their design by computer simulation in these increasingly common situations. This trend is greatly supported by the rapid increase in the computational power as well as its declining cost. The seminar will present the mathematical models for modern nonlinear analysis of concrete and reinforced concrete structures. The presented material model for concrete is based on plasticity formulation combined with the orthotropic smeared crack model. Reinforcement is modelled using the embedded approach that is extended by slip degrees of freedom to enable the modelling of bond failure. The model takes into account also reinforcement corrosion for life-cycle analysis. The presentation will show the model performance on selected validation problems and on the examples of successful case studies from research as well as design practice. Among others the following case studies will be presented: results from international prediction competitions, analysis of reinforced concrete as well as pre-stressed bridges, analysis of nuclear containments, anchoring technology and probabilistic and reliability assessment of bridges.