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[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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[\[PDF \(359K\)\]](#) [\[References\]](#)
MESO-SCOPIC NUMERICAL ANALYSIS OF CONCRETE STRUCTURES BY A MODIFIED LATTICE MODEL

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Realistic simulation of the mechanical behavior of concrete and reinforced concrete structures is performed by using a lattice type numerical model. Five different types of lattice members with simple constitutive models are introduced for mortar, coarse aggregate, steel, aggregate-mortar interface and steel-concrete interface. The meso-scopic morphology of concrete, which can be realized by the image-based geometry modeling technique, is taken into account. By the incorporation of the accurate meso-scopic morphology into the lattice type numerical modeling, the cracking behavior induced by the meso-scopic heterogeneities has been successfully captured.

Key Words: lattice model, RC-structures, heterogeneous material, strong discontinuity

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