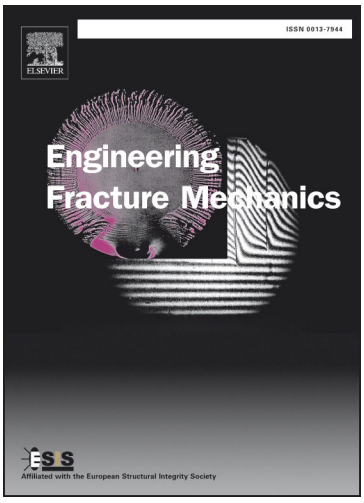

Role of aggregate debonding on the tensile response of concrete: A micromechanical approach

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Role of aggregate debonding on the tensile response of concrete: A micromechanical approach

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Abstract

A micromechanics based model has been developed to understand the effect of debonding of coarse aggregates from mortar on the macroscopic behavior of concrete under equibiaxial and uniaxial tension. Concrete is modeled as a two phase composite at the meso-scale. The interface is characterized by a bilinear cohesive law with softening. The elastic solutions of the stress and displacement fields due to the separation of the aggregate from the mortar matrix are computed at the meso-level. A homogenization scheme is implemented to obtain the overall behavior at the macro-scale. Factors such as aggregate size, aggregate content, elastic properties of the constituents and the interface properties are seen to affect the macroscopic response of concrete.

Key words: Debonding, Interface, Meso-scale, Micromechanics, Homogenization

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