

数学与系统科学研究院

计算数学所学术报告

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报告题目:

A stochastic multiscale model for predicting mechanical properties of fiber reinforced concrete

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311 报告厅

Abstract:

A stochastic multiscale computational model for predicting the mechanical properties of fiber reinforced concrete (FRC), subjected to tensile loading, is proposed. It involves the microscale, the mesoscale and the macroscale. On the mesoscale, the heterogeneity of the material is taken into account by a periodic layout of unit cells of matrix–fiber materials, consisting of short fibers and mortar. Material modeling on the microscale is characterized by a periodic layout of unit cells of matrix-aggregate composite materials, consisting of randomly distributed fine aggregate grains and cement matrix. A new unified micro–meso–macro homogenization procedure, based on two-scale asymptotic expressions, has been established. It is used for deriving formulae for multiscale analysis of FRC. The numerical results for the elastic modulus of FRC are compared with experimental results. The comparison shows that the proposed stochastic multiscale computational method is useful for determination of this mechanical property. The developed model is also applied to investigating the influence of different fiber materials on the elastic modulus, and Poisson’s ratio of FRC.

欢迎大家参加！