

译文

在材料研制中的连续介质细观力学有限元建模现状评论 (译文)

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摘要 评述了机械载荷下材料力学行为有限元模拟的先进技术. 分析了考虑材料微观及细观结构情况下, 对材料变形、损伤、断裂进行模拟时各种方法的优缺点及发展前景. 阐述了对材料行为模拟方法的发展, 包括基本的及先进的方法, 如体胞方法、真实结构模拟、粘结区模型等. 分析了在先进新材料的开发中运用有限元方法的可能性

关键词 [细观力学](#) [有限元法](#) [数值模拟](#) [材料力学行为](#)

分类号

CONTINUUM MESOMECHANICAL FINITE ELEMENT MODELING IN MATERIALS DEVELOPMENT: A STATE-OF-THE-ART REVIEW

MPA

Abstract

Advanced finite element techniques for the simulation of materials behavior under mechanical loading are reviewed. Advantages, limitations and perspectives of different approaches are analyzed for the simulation of deformation, damage and fracture of materials taking into account their micro- and mesostructure. Development of simulation methods for different aspects of materials behavior (such as the unit cell approach, real structure simulation, cohesive zone model, etc) is described including the simple versions of the methods as well as the advanced, highly efficient models. Possibilities of using the finite element method in the development of new materials are analyzed. This review article contains 131 references.

Key words [mesomechanics](#) [finite element method](#)

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