饱和多孔介质三维时域黏弹性人工边界与动力反应分析的显式有限元法

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Three-dimensional viscous-spring boundaries in time domain and dynamic analysis using e saturated porous medium

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摘要 本文基于Biot的饱和多孔介质本构方程,考察具有辐射阻尼的外行球面波,推导了饱和多孔介质三维黏弹性人工边界的泛
边界方程;在已有的饱和多孔介质二维显式有限元数值计算方法基础上,提出该理论的三维方法,并开发了实现该三维方法的7
算例表明饱和多孔介质三维时域黏弹性人工边界与动力反应分析的显式有限元法具有较好的精度和稳定性.

关键词：　饱和多孔介质　 三维黏弹性动力人工边界　 有限元法

Abstract： Based on Biot's dynamic theory for saturated porous media and the constitutive equations of elastic media,this paper discusses the normal and tangential stress formulae on the artificial boundary of shapes under the assumption of out-going spherical waves, and constitutes the three-dimensional viscou boundaries in time domain for saturated porous media; According to the dynamic analysis of saturated po media by using explicit finite element method, this paper develops the finite element method that could s three-dimensional problems, and develops finite element program. The analysis of the saturated porous m dynamic response indicates that the combination method of the explicit finite element method and the th dimensional viscous-spring boundary enjoy good accuracy and good stability.

Keywords：　 Saturated porous media　 Three-dimensional viscous-spring artificial boundary　 Finite elem method