论文

CHARACTERISTIC ALTERNATING-DIRECTION FINITE ELEMENT METHODS FOR NONRECTANGULAR REGIONS FOR COUPLED SYSTEM OF DYNAMICS OF FLUIDS IN POROUS MEDIA AND ITS ANALYSIS

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摘要   For coupled system of multilayer dynamics of fluids in porous

media, the characteristic alternating-direction finite element

methods for nonrectangular regions applicable to parallel

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three-dimensional schemes are used to form a complete set. Some

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关键词   Nonrectangular regions, multilayer dynam

分类号

Abstract For coupled system of multilayer dynamics of fluids in porous media, the characteristic alternating-direction finite element methods for nonrectangular regions applicable to parallel arithmetic are put forward and two-dimensional and three-dimensional schemes are used to form a complete set. Some techniques, such as calculus of variations, isoparametric

transformation, patch approximation, operator-splitting, characteristic method, negative norm estimate, energy method, the theory of prior estimates and techniques are used. For the nonrectangular regions case, optimal order estimates in $L^{{\rm 2}}$ norm are derived for the error in the approximation solution. Thus the well-known theoretical problem has been thoroughly and completely solved. These methods have been successfully used in multilayer oil resources migration-accumulation numerical simulation.

Key words   Nonrectangular regions   multilayer dynamics of fluids   characteristic finite element operator-split

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