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On the convergence of the multi-point flux approximation O-method: numerical experiments for discontinuous permeability. (English) Zbl 1089.76037

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Summary: This article presents numerical convergence results for the multi-point flux approximation O-method applied to the pressure equation in two dimensions. The discretization is made directly in physical space, and the investigated cases are simulated on structured, but generally skew grids. Skew grids need to be used to correctly represent the physics of the underlying flow problems. Special emphasis is made on cases which impose singularities in the velocity field. Such cases frequently arise in the description of subsurface flow. Analytical tools may not be applicable to fully answer the question of convergence for such cases; in particular not for the physical space discretization.

MSC:

76M12 Finite volume methods applied to problems in fluid mechanics
74S05 Finite element methods applied to problems in solid mechanics
76T30 Three or more component flows

Cited in **40** Documents

Keywords:

multi-phase flow; porous medium; singularities; pressure equation

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