

**Edwards, Michael G.**

**Unstructured, control-volume distributed, full-tensor finite volume schemes with flow based grids.** (English) [Zbl 1036.76034](#)  
Comput. Geosci. 6, No. 3-4, 433-452 (2002).

Summary: Locally conservative flux-continuous, full-tensor, discretization schemes are presented for general unstructured grids. The schemes are control-volume distributed, where flow variables and rock properties are assigned to polygonal control volumes derived from the primal grid. A relationship between these finite volume schemes and the mixed finite element method is established. An extension for unstructured grids is described that leads to a general symmetric positive definite discretization matrix for both quadrilateral and triangular grids. A novel flow based gridding approach for unstructured mesh generation is also proposed for heterogeneous reservoir domains. Results computed with the flux continuous schemes on unstructured flow-based grids demonstrate the advantages of the methods.

**MSC:**

[76M12](#) Finite volume methods applied to problems in fluid mechanics  
[76S05](#) Flows in porous media; filtration; seepage

Cited in **2** Reviews  
Cited in **57** Documents

**Keywords:**

polygonal control volume; mixed finite element method; symmetric positive definite discretization matrix; porous media; triangular grids; heterogeneous reservoir; quadrilateral grids

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