

**Aavatsmark, Ivar**

**An introduction to multipoint flux approximations for quadrilateral grids.** (English)

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Summary: Control-volume discretizations using multipoint flux approximations (MPFA) were developed in the last decade. This paper gives an introduction to these methods for quadrilateral grids in two and three dimensions. The introduction is kept on a basic level, and a brief summary to more advanced results is given. Only the O-method with surface midpoints as continuity points is discussed. Flux expressions are derived both in physical and in curvilinear space. Equations for calculation of the transmissibility coefficients are given, and an explicit solution is shown for constant coefficients.  $K$ -orthogonality, stability and monotonicity are discussed, and an iterative solution technique is presented. Two numerical examples close the paper.

**MSC:**

**76M30** Variational methods applied to problems in fluid mechanics

**76S05** Flows in porous media; filtration; seepage

Cited in **1** Review  
Cited in **166** Documents

**Keywords:**

anisotropy; control-volume discretizations; inhomogeneity

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