Control-Volume Distributed Multi-Point Flux Approximation (CVD-MPFA) and Grid Constraints for Flow in Porous and Fractured Media

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Key words: Finite-volume, Flux-continuous, Grid Constraints, CVD-MPFA

Abstract
Flux-continuous finite-volume schemes comprised of control-volume distributed multipoint flux approximations (CVD-MPFA) are presented for flow in porous media with fractures. Both cell-centred and cell-vertex approximations are considered and maintain a single degree of freedom per control-volume, per flow variable and provide consistent flux approximations for general tensors on structured and unstructured grids. Development of surface CVD-MPFA approximation, grid constraints and fracture model approximations are discussed. The schemes are applied to problems including fractured anisotropic media, and comparison of scheme performance is presented.

References