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MULTISCALE CVD-MPFA FINITE-VOLUME FORMULATIONS ON GENERAL GRIDS

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Development of multiscale finite-volume (MSFV) methods for general grids is presented. Families of Darcy-flux approximations have been developed for consistent approximation of the general tensor pressure equation arising from Darcy's law together with mass conservation. The schemes are control-volume distributed (CVD) with flow variables and rock properties sharing the same control-volume location and are comprised of a multipoint flux family formulation (CVD-MPFA) [1, 2, 3]. The schemes are used to develop CVD-MPFA based multiscale formulations extending the earlier work of [4], and are applicable to both structured and unstructured grids in two-dimensions. Novel basis functions are proposed that prove to be crucial for the extension of MSFV to general grids. Results are presented for a variety of test cases.

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