

# MIXED GENERALIZED MULTISCALE FINITE ELEMENT METHOD FOR HETEROGENEOUS AND FRACTURED POROUS MEDIA

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We present a mixed generalized multiscale finite element method (GMs-FEM) for solving flow in heterogeneous, fractured and perforated media. Our approach constructs multiscale basis functions following a GMsFEM framework and couples these basis functions using a mixed finite element method, which allows us to obtain a mass conservative velocity field. To construct multiscale basis functions for each coarse edge, we design a snapshot space that consists of fine-scale velocity fields supported in a union of two coarse regions that share the common interface.

We present numerical results for several test problems: problem in perforated domain, problem with highly permeable inclusions, dual continuum model and problem in fractured media.