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MODELING OF CAPILLARY SEALING FRACTURES DURING CO_2 INJECTION BY NON-MATCHING MULTI-BLOCK GRIDS

Adil M. Sbai*

* BRGM, Water Division
3, Avenue Claude Guillemin, BP 36009, 45060 Orléans CEDEX 2, France
e-mail: a.sbai-AT-brgm.fr, web page: http://www.brgm.fr/

Summary. Among open scientific challenges facing large scale implementation of CO_2 sequestration, are geological structures at different scales not properly dealt with at the injection scale. Faults and fractures, in particular, could have large impacts on the flow dynamics and CO_2 leakage to the atmosphere. In order to give a full 3D representation to these sensitive zones we present an approach for simulating multiphase fluid flow on non-overlapping, non-matching, multi-block grids. Capillary pressure and relative permeability properties of fault zones are explicitly taken into account in this approach. The underlying technique was implemented in the framework of a domain decomposition leading to development of a multilevel multigrid iterative scheme. Different interpolation methods between the coarse and fine grids in the fault zones have been tested leading to an improved implicitness, and thus allowing larger time step sizes to be taken. Results of numerical experiments for a simplified, but computationally demanding reservoir models are presented.