The MRCM method for porous media flows

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Nowadays applications of fluid flow in subsurface problems governed by Darcy's law, such as those involving Oil & Gas production, compositional flow in oil reservoirs and pollutant transport in aquifers, may require over a billion computational cells to predict with reasonable accuracy the flow variables. Recently, with the aim to handle such problems, we have proposed the Multiscale Robin Coupled method (MRCM) [1] as a generalization to the Multiscale Mixed Method [2], which is in turn based on a domain decomposition technique introduced by Douglas et al [3], in which the local problems are subject to Robin type boundary conditions. In this talk, the new method is recalled and extensively assessed by means of challenging 2D and 3D problems involving high-contrast channelized porous formations.

References

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