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Contribution ID: **119**   Type: **Oral Presentation**

BDDC for MHFEM discretization of unsteady two-phase flow in porous media

Wednesday, 2 June 2021 15:15 (15 minutes)

This work deals with the application of the Balancing Domain Decomposition based on Constrains (BDDC) method to unsteady two-phase flow problems in porous media.
We briefly describe the spatial discretization of the problem which is based on the mixed-hybrid finite element method (MHFEM) and semi-implicit time discretization.
Then, we describe the BDDC method, in detail discuss the differences between the symmetric and non-symmetric cases, and present necessary modifications of the algorithm for the more complicated non-symmetric case. We describe the parallel implementation of the method and highlight the critical steps of the algorithm that affect the performance and scalability.

The parallel implementation is then tested on benchmark problems in 2D and 3D and its efficiency is investigated on various meshes.
The numerical results indicate that the method preserves high computational efficiency for increasing number of processes and, therefore, allows solving problems on very fine meshes. In the case of unsteady problem, additional speedup is achieved using the information from previous time steps for the solution in the current time step.

Time Block Preference

Time Block A (09:00-12:00 CET)

References

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Primary authors: SOLOVSKÝ, Jakub (FNSPE, CTU in Prague); FUČÍK, Radek (Czech Technical University in Prague); ŠÍSTEK, Jakub (Institute of Mathematics, Czech Academy of Sciences)

Presenter: SOLOVSKÝ, Jakub (FNSPE, CTU in Prague)

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