Contribution ID: **706** Type: **Oral Presentation**

A space-time multiscale mortar mixed finite element method for flow in porous media

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We develop a space-time mortar mixed finite element method for parabolic problems modeling flow in porous media. The domain is decomposed into union of subdomains with non-matching grids and different time steps. The space-time variational formulation couples mixed finite elements in space with discontinuous Galerkin in time. Continuity of flux across space-time interfaces is imposed via coarse-scale space-time mortar finite elements, resulting in correct mass conservation. A priori error estimates for the spatial and temporal error are established. A space-time non-overlapping domain decomposition method is developed that reduced the global problem to a space-time coarse-scale mortar interface problem. Each interface iteration requires solving space-time subdomain problems, which is done in parallel. The convergence of the interface iteration is analyzed. Numerical results illustrate the theoretical results and the flexibility of the method for modeling flow in heterogeneous porous media with features localized in space and time.

Time Block Preference

Time Block C (18:00-21:00 CET)

References

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