

QUASI-NEWTON TECHNIQUES FOR PARTITIONED SIMULATION OF COUPLED PROBLEMS

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ABSTRACT

Coupled problems like fluid-structure interaction are frequently solved in a partitioned way, by coupling two or more existing solvers. If the interaction between the different coupled problems is strong, then coupling iterations are required in each step of the calculation to enforce the equilibrium conditions at the interface. However, the convergence of these iterations can be slow when using a fixed-point strategy, which significantly increases the computational cost. Therefore, quasi-Newton techniques are often used to stabilize and accelerate the convergence of these iterations.

This mini-symposium welcomes new developments related to quasi-Newton techniques for the partitioned simulation of fluid-structure interaction, but also for other coupled problems. This includes new methods, comparison of methods, parallel implementations, dimensional scaling tests, best practice guidelines, parameter sensitivities and challenging use cases.