

Multiphysics problems such as fluid-solid interaction, poro-elasticity, electrochemical deposition, electromechanical systems, etc., appear in many engineering and scientific disciplines. Such coupled problems are among the most difficult in computational engineering. On account of the fact that the subproblems typically display disparate length and time scales, the aggregated problem bears a pronounced multiscale character. This multiscale behaviour poses many challenges for discretization and solution techniques. On the one hand, it may be necessary to apply nonmatching meshes, to accommodate the disparate length and time scales. On the other hand, the difference in length and time scales induces a pronounced stiffness in the problem, which forms an asperity for iterative solution methods. Moreover, to avoid excessive complexity of the computational model, it is often necessary to use hierarchical models to include the effects of microscale features in one subsystem on the macroscale behaviour of the other subsystems.

This minisymposium endeavours to provide a forum for discussing state-of-the-art computational techniques for coupled problems. Papers in the following areas are welcome:

- Fast and robust iterative solution procedures for strongly-coupled problems
- Coupling techniques for non-matching meshes in multiphysics applications
- Efficient time-integration methods for stiff multiphysics problems
- Hierarchical multiscale modeling of multiphysics problems
- Coupling techniques for particle/continuum problems
- Applications of computational techniques to coupled problems