NOVEL MATHEMATICAL AND NUMERICAL MODELS FOR MULTIPHYSICS AND MULTISCALE SYSTEMS

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MINISYMPOSIUM

The increase in computational resources has enabled an extremely enhanced resolution up to which we are capable of approximating physical phenomena. One of the most challenging task for a modeller is to choose what are the relevant (and irrelevant) parts of a phenomenon, and among these choices resides the choice of a characteristic scale. Thankfully, newer mathematical tools can help in developing upscaled models that capture the contribution of phenomena at much smaller scales, such as homogenization, mixed dimensional modeling, and also simply by scaling up the dimension of the computational model.

In this minisymposium we hope to foster the dialogue among communities using different tools for the mathematical modeling of multiphysics and multiscale phenomena, such as cardiovascular biomechanics, fracture mechanics and poroelasticity. Our interests are broad, meaning that we welcome contributions coming from:

• Theory: mathematical homogenization, mixed dimensional systems, continuum mechanics.
• Modeling: soft tissue, metabolism, geosciences.
• Methodology: multiscale and multiphysics solvers, linear systems and preconditioners, operator splitting, partitioned schemes, numerical discretizations, software for scientific computing