

Analysis of Multiscale Interface Couplings of Poroelasticity and Lumped Hydraulic Systems

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In biomechanics, local phenomena, such as tissue/organ perfusion, are strictly related to the global features of the surrounding blood circulation. We consider a heterogeneous model where a local, accurate, 3D description of tissue perfusion by means of poroelastic equations is coupled with a systemic 0D lumped model of the remainder of the circulation. This represents a multiscale strategy, which couples an initial boundary value problem to be used in a specific tissue region with an initial value problem in the rest of the circulatory system. We present new results related to well-posedness analysis and solution methods for the multiscale model under consideration.

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