FETI-method for biomechanical applications

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In this talk the focus will be on the structural model for the nonlinear elastic behavior of biological tissues, for example arterial walls or cardiac tissue. These materials are anisotropic due to a preferential orientation of collagen fibers in the tissue and consist of several layers. The resulting nonlinear models lead to very complex and time-consuming algorithms.

A way to treat these algorithms is the strategy of parallel computing. One possibility to achieve such a parallelization is to apply domain decomposition methods, which are also motivated by the composition in layers of the considered biological tissues. We outline the main ideas of one particular approach, the finite element tearing and interconnecting (FETI) method and its application to biomechanical models.

Finally numerical examples are included where we compare different solution and preconditioning techniques.

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