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21251. *Some Iterative Algorithms for Biot Equations and Applications in Biomechanics.*

Biot equations have been widely used in Biomechanics. For example, modeling brain edema and cancellous bones. We aim at solving the Biot model under stabilized finite element discretizations. To solve the resulting generalized saddle point linear systems, some iterative methods are proposed and compared. In the first method, we apply the GMRES algorithm as the outer iteration. In the second method, the Uzawa method with variable relaxation parameters is employed as the outer iteration method. In the third approach, Uzawa method is treated as a fixed-point iteration, the outer solver is the so-called Anderson acceleration. In all these methods, the inner solvers are preconditioners for the generalized saddle point problem. In the preconditioners, the Schur complement approximation is derived by using Fourier analysis approach. These preconditioners are implemented exactly or inexactly. Extensive experiments are given to justify the performance of the proposed preconditioners and to compare all the algorithms. (Received September 24, 2017)