

Smoothed Finite Element Method
Based on Incremental Implicit Equilibrium Equation
for Large Deformation Mesh Rezoning Analysis

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A new smoothed finite element method (S-FEM) for large deformation mesh rezoning analysis is proposed. Owing to the adoption of the selective ES/NS-FEM-T3 or FS/NS-FEM-T4, the proposed method avoids both the shear and volumetric locking even with the use of triangular or tetrahedral meshes that are generally used in mesh rezoning. Furthermore, the proposed method adopts the incremental implicit equilibrium equation (IIEE) as the equation to solve to avoid temporal discontinuity of equilibrium states; therefore, the mesh rezoning is stabilized. The detail formulations of the proposed method, such as how to build the equation to solve, how to remesh the domain, how to map the stress/strain states from the old mesh to the new mesh and so on, are presented.

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