

Lamichhane, Bishnu P.

From the Hu-Washizu formulation to the average nodal strain formulation. (English)

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Summary: We present a stabilized finite element method for the Hu-Washizu formulation of linear elasticity based on simplicial meshes leading to the stabilized nodal strain formulation or node-based uniform strain elements. We show that the finite element approximation converges uniformly to the exact solution for the nearly incompressible case.

MSC:

74S05 Finite element methods applied to problems in solid mechanics

74B05 Classical linear elasticity

74G65 Energy minimization in equilibrium problems in solid mechanics

65N30 Finite element, Rayleigh-Ritz and Galerkin methods for boundary value problems involving PDEs

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Keywords:

mixed finite elements; average nodal strain; nearly incompressible elasticity; primal and dual meshes

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