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Isogeometric collocation: A mixed displacement-pressure method for nearly incompressible elasticity in small and large deformations

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We investigate primal and mixed u-p isogeometric collocation methods for application to nearly-incompressible isotropic elasticity [1]. The primal method discretizes the boundary value problem in terms of the displacement unknowns, and the mixed method employs both displacement and pressure unknowns. As benchmarks for what might be considered acceptable accuracy, we employ constant-pressure Abaqus finite elements that are widely used in engineering applications. As a basis of comparisons, we present results for compressible elasticity. The performance of the proposed methods will be evaluated on benchmark problems. Small deformations will be initially considered, but also an extension to large deformations will be introduced.

REFERENCES

[1] S. Morganti et al., Isogeometric Collocation: A Mixed Displacement-Pressure Method for Nearly Incompressible Elasticity, *CMES*, **2021**, DOI: 10.32604/cmes.2021.016832