

PROJECTION METHODS FOR CONSTRAINED PROBLEMS IN ISOGEOMETRIC ANALYSIS

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Projection techniques, based on a moving least square approximation, are used to deal with constraints associated to both volumetric and transverse shear locking effects in isogeometric analysis. In the resulting finite dimensional approximation space, incompressible and transverse shear deformation fields are projected to lower dimensional subspaces, alleviating the volumetric and the transverse shear locking phenomena.

As different degrees in the approximation functions can be used in isogeometric analysis and, therefore, different Gauss integration rules, the projection methods based on the moving least square approximation provide a general methodology to overcome several different locking pathologies. The effect of the proposed projection techniques on higher degree basis functions for isogeometric analysis is also addressed.

The proposed methodology is assessed with some numerical examples for three-dimensional NURBS (Non-uniform rational basis spline) with only translational degrees of freedom for both shell-type and plane strain structures.

REFERENCES

- [1] R.P.R. Cardoso and J.M.A. Cesar de Sa, Blending Moving Least Squares Techniques with NURBS Basis Functions for Nonlinear Isogeometric Analysis. *Comp. Mech.*, accepted for publication, 2014.