A Two-Dimensional Isogeometric Boundary Element Method For Linear Elastic Fracture

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ABSTRACT

The present work proposes a method for simulating linear elastic fracture and crack growth through an isogeometric boundary element method [1][2]. Non-Uniform Rational B-Splines (NURBS) are used to approximate the geometry, boundary displacements and boundary tractions. Collocation is employed to generate the system of equations. To avoid the degeneration seen when modelling coincident crack surfaces with conventional boundary element methods, a dual boundary element method formulation is applied [3]. An algorithm for the placement of collocation points is detailed with the treatment of all singular integrals outlined. Stress intensity factors are compared against closed-form solutions to verify implementation and a comparison of crack growth propagation paths is made with the extended finite element method.

REFERENCES

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