Testing the use of radial basis function augmented with polynomials as basis functions in the boundary element method for heat transfer problems

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The quality of the numerical solutions obtained by the Boundary Element Method (BEM) is directly affected by the type of interpolation function used for the temperature interpolation, its normal derivative and geometry along the boundary. Interpolation by radial basis function augmented with polynomials has been shown to be more accurate than Lagrange interpolation for a range of different functions.

Therefore, this paper is concerned with the application of such functions as the interpolation functions for all boundary values in the boundary element method for the numerical solution of 2d heat transfer problems. Numerical examples with different geometries and temperature distribuitions are presented and comparisons with both isogeometric and classical formulation are made to demonstrate the improved accuracy of the proposed method.

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