عنوان مقاله:

Combination of the simple BEM and ICA to detect a cavity inside a FG domain

محل انتشار:

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خلاصه مقاله:

Detection of a cavity inside a functionally graded material (FGM) domain is considered as an inverse problem based on heat conduction equation and using only boundary measurements. The thennal property of the FGM is assumed to have quadratic variation in one direction. The boundary elements method (BEM) direct solution of theheat conduction through this kind of FGM is adapted at First. The imperialist C ompetitivc Algorithm (ICA) which is an evolutionary and meta-heuristic global optimizationis used in conjunction with the inverse application of BEM. An inverse computer code (with MATLAB) is developed which employs the boundary temperature measurements data obtained in this study by solving the direct boundary elements code with applying supposed thermal conductivity along with the geometry and cavity configuration. The solved example are verified to show the effectiveness of the approach and the accuracy of the developed code. The location and size of an internal circular cavity could be determined when thermal conductivity is known with this approach.

کلمات کلیدی:

cavity detection, Functionally Graded Material (FGM), Boundary Elements Method (BEM), Imperialist Competitive (Algorithm (IC A