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Optimization of FGM Sandwich Beams Using Imperialist Competitive Algorithm

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Abstract : Sandwich structures are used in a variety of engineering applications including aircraft, construction and transportation where strong, stiff and light structures are required. In this paper, frequency maximization of Functionally Graded Sandwich (FGS) beams resting on Pasternak foundations is investigated. A generalized power-law distribution with four parameters is considered for material distribution through the thicknesses of face layers. Since the search space is large, the optimization processes becomes so complicated and too much time consuming. Thus a novel meta–heuristic called Imperialist Competitive Algorithm (ICA) which is a socio-politically motivated global search strategy is implemented to improve the speed of optimization process. Results show the success of applying ICA for engineering problems especially for design optimization of FGM sandwich beams.

Keywords : sandwich beam, functionally graded materials, optimization, imperialist competitive algorithm
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