عنوان مقاله:

Optimization of infinite composite plates with quasi-triangular holes under in-plane loading

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خلاصه مقاله:

This study used particle swarm optimization (PSO) to determine the optimal values of effective design variables acting on the stress distribution around a quasi-triangular hole in an infinite orthotropic plate. These parameters were load angle, hole orientation, bluntness, fiber angle, and material properties, which were ascertained on the basis of an analytical method used by Lekhnitskii [3]. The cost function was regarded as the maximum stress created around the hole and was calculated using the aforementioned analytical approach. The finite element method was then employed to verify the results of the analytical calculation. The overlap in the analytical and FEM calculations confirmed the validity of the solution proposed in this research. The findings further indicated that the design variables significantly affect the stress distribution around quasi-triangular holes and structural load-bearing capacity. The performance of the PSO algorithm was also investigated.

کلمات کلیدی:

Infinite orthotropic plate, Quasi-triangular hole, Particle swarm optimization, Analytical Solution, Complex variable method

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