應用類啟發式演算法於複合材料板之高勁度設計與輕量化設計

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摘 要

以複合材料取代金屬物件為現行產業的趨勢，而複合材料疊層板之疊層排序將影響疊層位移與強度，進而造成疊層之脫層與破壞。本研究以分層一階剪變形理論的有限元素法推導複合材料板的位移與強度分析，並能正確地與多位學者的文獻相驗證，因此，採用分析後的數值作為最佳化的目標式。且將位移與強度分別對不同長寬比、厚度比、邊界條件和施力方式作分析與探討。 最佳化部分，分別以遺傳基因演算法、群蟻最佳化演算法與混合螞蟻演算法作為最佳的方法。最佳化分為三部份，分別為等厚度疊層板位移最佳化、非等厚度疊層板位移最佳化以及最佳強度之輕量化。並以最佳化之結果分別做討論與比較。

關鍵詞 : 遺傳基因演算法 ; 群蟻演算法 ; 混合螞蟻演算法 ; 有限元素法 ; 分層一階剪變形理論 ; 輕量化

目錄

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