翼翅平板結構的主被動式顫振控制

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摘 要

本論文的目的是研究壓電纖維複合材料致動器在翼翅結構振動和顫振控制的應用，壓電纖維複合致動器為三明治結構，包括中間的矩形壓電陶瓷條狀物和環氧樹酯，上下層為黏膠、電極和高分子聚合薄膜。電極黏貼於薄膜為指叉式電極，可以將致動電場與壓電陶瓷同一方向平行。壓電纖維複合致動器與傳統式壓電陶瓷致動器比較其具有高性能，可撓曲、耐久性與方向性致動的優點。 在本研究中，壓電纖維複合材料致動器以反對稱黏貼配合三種控制技術，同時抑制第一彎曲與扭曲振動平板的翼翅結構，本研究中使用的控制技術為主動式控制、被動式控制與混合式控制。 隨著反對稱配置的壓電纖維複合材料致動器，控制模式可針對第一彎曲和扭曲模態作個別控制而不會產生能量溢滿狀態。速度回饋方法與R-分流電路、RL-分流電路分別用於主動式振動與被動式振動。

關鍵詞 : 壓電纖維複合材料致動器

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