

圓桿波傳的阻抗控制分析

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摘要

振動的問題對於結構物及機械設備是一直存在的，如何有效抑制或減輕其振動的影響，又不降低結構強度是一個重要的課題。本文將以波傳和阻抗不匹配理論控制結構物振動能量波的傳遞，針對阻抗分析及波傳控制，研討縱向與橫向其控制振動能量波傳遞。實驗方法主要是將不同的嵌入物，透過不同長度和楊氏系數的嵌入物，進行實驗並比較嵌入物長度改變後所產生之減振差異性，其中包含材料之楊氏系數，以及擺放位置，探討條件改變所帶來的減振效益。並運用有限元素分析、理論與實驗相互比較。實驗結果顯示，縱向部分第一模態的能量波傳遞，隨著嵌入物的楊氏係數、長度、置入位置和分佈情形的改變，都皆有正面的抑制效果。橫向部分第三模態，不論在材料變化或長度變化上其能量波皆有明顯抑制成效。

關鍵詞：波傳、阻抗不匹配、減振

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