MFC能量收集之研究

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摘 要

壓電能量擷取即是使用壓電材料將周遭的能量擷取並轉換成可使用的電能。壓電材料為一機電耦合的材料，可針對其施以機械應變使其產生電能。利用壓電材料將週遭系統的振動能量轉換成電能為本論文所要探討的壓電能量擷取系統。 因壓電能量擷取系統所擷取到的能量很微小，很難直接供給各種電子產品使用，必須將電能匯整與儲存。本論文的目的是為了瞭解壓電能量擷取系統的特性，振動的懸臂樑為例，以Matlab模擬分析懸臂樑的振動情形，並在末端給予質量探討在振動應變上的影響，將研究課題區分為以下部分:1.分析懸臂樑之模態特性並推導其公式;2.給予懸臂樑施加不同的末端質量並分析其放大效率;3.壓電元件在懸臂樑上的黏貼位置之最佳化設計。 本論文的壓電擷能放大系統，可在減少使用壓電元件的情況下，結合端點質量的加入，使應變量改變，再加上最佳化的設計，可達到更高的擷能效率。

關鍵詞 : 壓電能量擷取、振動模態、懸臂樑

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