

引擎排氣系統之主動式噪音控制

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摘要

本論文主要是描述利用主動式噪音控制技術來實現引擎排氣系統之管路噪音控制，以提高車輛之駕駛舒適性。在控制法則上採用有限脈衝響應濾波器來設計可變收斂係數之適應性演算法與調變增益之固定式控制器，並利用數位信號處理器來實現即時控制。在控制架構中，聲學回授效應經常會造成控制系統的不穩定性，因此在控制器的設計上將納入聲學回授效應的影響，並採用有方向性的麥克風與向後式之控制喇叭以更有效降低此影響。研究中首先以人工合成音源、鼓風機噪音為研究方向，進而考慮具有溫度影響之引擎排氣系統之週期性多頻噪音。在訊號擷取上採用聲學感知器(麥克風)與非聲學感知器(光學式轉速計)量測參考訊號。本論文將評估此二種控制架構實現於不同的噪音源控制系統上，實驗的結果顯示主動式噪音控制系統可有效的降低人工合成音源之寬頻噪音、風扇噪音與引擎排氣系統所產生的週期性多頻噪音。

關鍵詞：主動式噪音控制，數位信號處理器，聲學回授，引擎排氣系統

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