簾幕式氣囊數值模型之建立與分析

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摘 要

在側撞事故的比例不斷增加及提升乘員安全的要求下，側撞 防護氣囊將成為車輛被動安全裝備最佳考量之一。為能充分有效 設計安全的空氣囊糸統，氣囊的展開與相關影響參數對乘員安全 的探討與分析更不可少，以能有效降低車輛碰撞時乘員之損傷。 並且有效運用CAE 的技術於車輛撞擊模擬與試驗的分析研究 上，可達到增進產品設計開發之品質與效能，故為建立CAE 模擬 技術在車輛側面碰撞被動安全防護裝置的研發能量，本論文將以 防側撞簾幕式氣囊為研究對象，首先依據CAE 氣囊設計流程建構 氣囊數值模型，並利用美規FMVSS 201U 頭部自由運動(FMH)進 行簾幕式氣囊安全性的評估，並探討防護氣囊數值模型之氣囊袋 型式、厚度及充氣器質量流率等參數對乘員安全防護的影響；最 後針對Ford Taurus 汽車進行防側撞簾幕式氣囊模型設計，依據美 規FMVSS 201P 進行全車側撞剛性柱測試模擬，探討簾幕式氣囊 與人偶間之動態行為及頭部防護性能評估，並進行簾幕式氣囊充 氣器質量流率及氣囊袋厚度的適化設計，以提供車輛防側撞簾幕 式氣囊研發的參考。

關鍵詞 : LS-DYNA，側面碰撞，簾幕式氣囊，頭部自由運動測試， 剛性柱側撞測試

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