考慮翻覆安全之小型運動休閒越野車設計與分析

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摘 要

本論文以設計一台符合2010 Baja SAE Rule規範之Mini Baja越野車作為研究對象。SAE Mini Baja競賽源至於1976年美國South Carolina 大學Dr. Stevens博士指導下所規劃成立，SAE Mini Baja 自此逐漸發展成美國及國際間大學間相互競爭的校際工程設計競賽。SAE Mini Baja競賽之目的是希望由學生所組的團隊能發揮團隊合作的精神，並運用在校所學的知識及技能實際去設計及製造出可以行駛在各種崎嶇嚴苛地形的Mini Baja越野車。而所有參賽的Mini Baja越野車都必須遵守SAE Mini Baja的規範要求及限制，並通過SAE的技術檢查和裁決，才能准許參賽。 由於目前SAE Mini Baja越野車之行駛只侷限於賽道場上，未來如開放上路勢必通過汽車安全法規才能在道路上行駛，所以本論文採用美規FMVSS-208側向翻覆試驗，對Mini Baja越野車進行模擬試驗。首先本論文利用HyperMesh軟體建構Mini Baja越野車之數值模型，再利用LS-DYNA軟體對Mini Baja車架進行靜態扭轉勁度測試，其次，進行Mini Baja車架進行靜態強度模擬；最後，本論文依據美規FMVSS-208側向翻覆測試對Mini Baja越野車進行模擬，探討車輛在翻覆過程中之動態反應、取得車輛重心之角速度、速度、加速度之曲線以及車架結構在翻覆過程中之最大平均應力位置；本論文之研究成果，應可為後續SAE Mini Baja越野車設計提供參考。

關鍵詞 : FMVSS-208側向翻覆測試、LS-DYNA

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