爆震引致結構空蝕現象之探討

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摘 要

衝擊壓力脈衝的產生是由於水下爆炸與船殼結構發生碰撞導致動態反應，由於流體-結構之間相互作用，總壓沿著船體成為負壓。在無法維持張力情況下，水壓降低至蒸氣壓而後結構空蝕發生。浮動結構之瞬態反應受到結構空蝕效應影響是非常複雜的，因此研究水下動態浮動結構變成是需要的。 Taylor平板理論中，採用空氣支持盒型結構受水下初始震波衝擊後預估kick-off速度，而空蝕之切斷效應時間包括在研究之中。此發展成熟的水下LS-DYNA技術用來研究結構空蝕條件下之結構動態反應。 Bleich 和 sandler ’s之問題說明結構與雙線性流體之間相互作用關係而Ramajeyathilagam 和 Vendhan ’s問題是有關變形和破裂的矩形薄板受水下衝擊，並利用LS- DYNA軟體來驗證計算結構空蝕現象之影響。此外Sprague 和 Geers ’船狀結構受到水下爆炸之研究採用空蝕體積和結構反應。研究問題之結果與目前相關文獻非常接近，並顯示目前研究非常良好。

關鍵詞 : 水下爆炸、空蝕、結構空蝕

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