船艦水屏防禦之研究

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摘 要

本論文乃是以線串炸藥（line charge）於水下爆炸形成水屏防禦（Barrier defense）之分析為研究對象。在1995年7月間，美國海軍水面戰鬥中心（Naval Surface Warfare Center Dahlgren Division, NSWCDD）發展出一種新的技術概念，此概念即認為應用水下爆炸產生之水屏形成之防禦系統可有絕對之效益，尤其應用在海軍防禦對抗高速反艦飛彈（ASCMs）之攻擊。水屏技術乃運用較低經費之水下爆炸產生之水屏來提供海軍最低限度之防禦系統。此類水屏或水障壁（Barrier）的產生來自於多顆水下炸藥在淺水下爆炸而成。為了持續發展以及水障壁概念的評估， NSWCDD進行了線串炸藥之水下爆炸測試，探討離散型（Discrete）及連續型（Continuous）線串炸藥爆炸後噴入空氣中的水量所產生之水屏的防禦能力。 本論文以美國NSWCCD之水屏試驗場景及量測結果為研究與驗證對象，利用MSC.Dytran軟體進行自由液面水柱之模擬探討，分析離散型線串炸藥與連續型線串炸藥二種型態之線串炸藥於水面下引爆後，探討厚度、高度及密度對產生水屏之影響，由二維之連續型與離散型線串炸藥模型以及三維之離散型線串炸藥模型所計算出之結果，比較水屏高度、密度及剖面圖之輪廓。最後，由二維及三維線串炸藥爆炸研究探討優質水屏之理想爆炸深度及其產生之水柱輪廓。

關鍵詞 : 反艦飛彈 ; 水障壁 ; 水屏 ; 線串炸藥

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