

Cavitation Effects on a Ship Structure Subjected to an Underwater Explosion

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ABSTRACT

The main shock wave and bubble pulse generated in the process of the underwater explosion. The main shock waves propagate and contact with the surface of the structures will produce vertical velocity, this may produce structural cavitation zone. The structural effect of cavitation on surface of the ship that close to the water surface is significant. So when studying the overall effect of the ship in underwater explosion, it is necessary to take into account the effect of the cavitation. The objective of present thesis is to study the effect of kick-off velocity; The Couple Eulerian-Lagrangian technique embed in ABAQUS software and Taylor plate theory were used to study the ship structural dynamic responses subject kick-off velocity and structural cavitation produced in an underwater explosion. Furthermore, ABAQUS finite element software was used to study the response of ship structure in withstanding the pressure in underwater explosion. The von-Mises stress that occurs in ship structure, becomes longer when the distance between the change and ship increases. The numerical result in this study may provide helpful informations for the ship design work.

Keywords : underwater explosion、cavitation、structure cavitation

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