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# SIMULATION OF COMPOSITE STRUCTURES SUBJECTED TO IMPACT LOADING INDUCED BY BUBBLE COLLAPSE

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## ABSTRACT

This paper deals with the transient response of a glass-epoxy composite structure subjected to impact loading induced by underwater explosion bubble. The boundary-element method (BEM) is used to simulate the physical process of the bubble growth, contraction and collapse while the finite element method (FEM) is used to calculate the glass-epoxy composite structure response to impact loading induced by the underwater explosion bubble. The interaction of the composite structures and the bubble is simulated numerically via the coupled BE-FE code. Transient stress response of the composite structure to the impact loading induced by the bubble collapse is studied for different charge weights and the charge distances. The mutual effects of relative location between the bubble and the composite structure are also investigated.

Figure 1 shows the meridional stresses of the stiffened composite hull at three time instants: 50, 101, 110 ms for a charge detonated at three different locations.

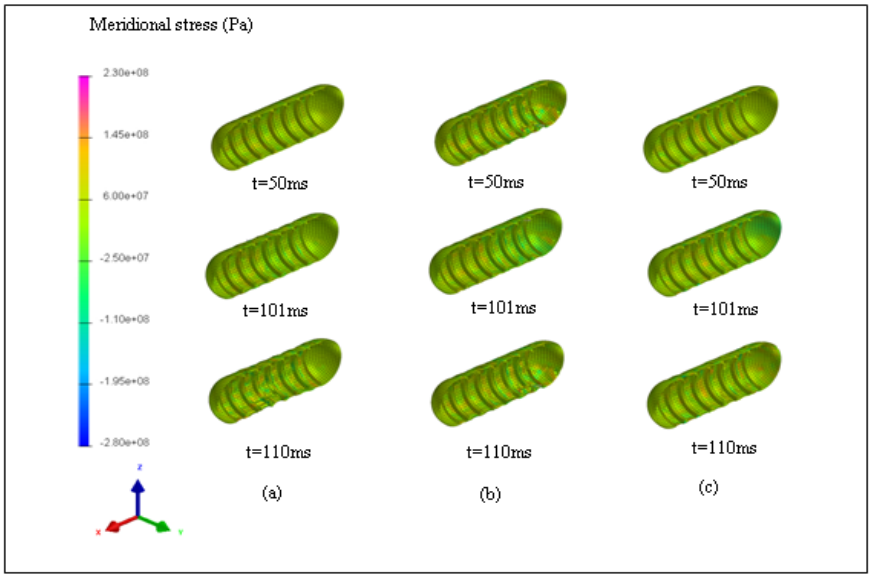

Fig. 1 Meridional stress distributions of the stiffened composite hull.

Figure 2 shows the circumferential stresses of the stiffened composite hull at three time instants: 50, 101, 110 ms for a charge detonated at three different locations.

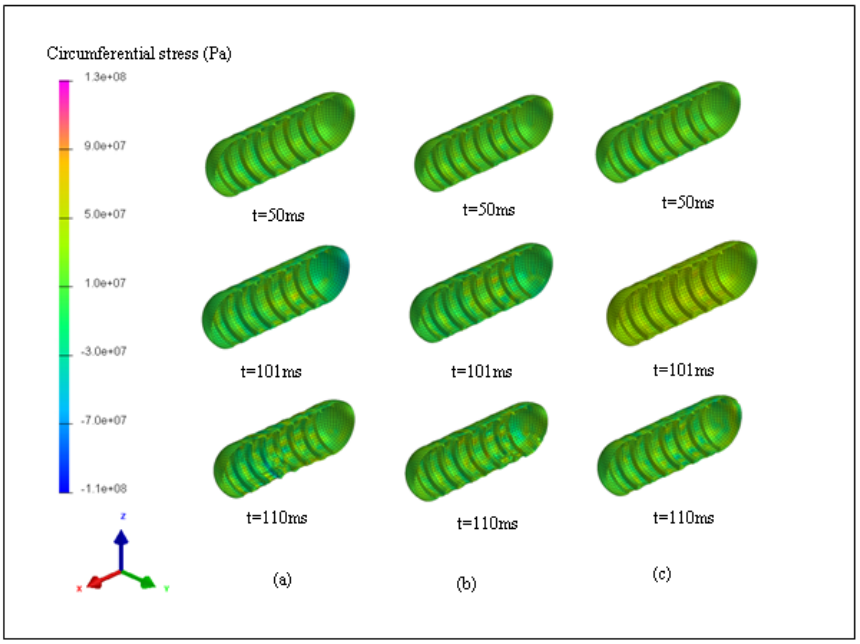


Fig. 2 Circumferential stress distributions of the stiffened composite hull.

From the results obtained, some insights to the problem of the interaction between the bubble and composite structures would be deduced.

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