

Fluid Structure Interaction Study between Ahead and Angled Impact of AGM 88 Missile Entering Relatively High Viscous Fluid for K-Omega Turbulence Model

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Abstract : The main objective of this work is to anatomize on the various parameters of AGM 88 missile anatomized using FSI module in Ansys. Computational fluid dynamics is used for the study of fluid flow pattern and fluidic phenomenon such as drag, pressure force, energy dissipation and shockwave distribution in water. Using finite element analysis module of Ansys, structural parameters such as stress and stress density, localization point, deflection, force propagation is determined. Separate analysis on structural parameters is done on Abacus. State of the art coupling module is used for FSI analysis. Fine mesh is considered in every case for better result during simulation according to computational machine power. The result of the above-mentioned parameters is analyzed and compared for two phases using graphical representation. The result of Ansys and Abaqus are also showed. Computational Fluid Dynamics and Finite Element analyses and subsequently the Fluid-Structure Interaction (FSI) technique is being considered. Finite volume method and finite element method are being considered for modelling fluid flow and structural parameters analysis. Feasible boundary conditions are also utilized in the research. Significant change in the interaction and interference pattern while the impact was found. Theoretically as well as according to simulation angled condition was found with higher impact.

Keywords : FSI (Fluid Surface Interaction), impact, missile, high viscous fluid, CFD (Computational Fluid Dynamics), FEM (Finite Element Analysis), FVM (Finite Volume Method), fluid flow, fluid pattern, structural analysis, AGM-88, Ansys, Abaqus, meshing, k-omega, turbulence model

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