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Investigation of the Effect of Grid Size on External Store Separation Trajectory Using CFD

Authors : Alaa A. Osman, Amgad M. Bayoumy Aly, Ismail El baialy, Osama E. Abdellatif, Essam E. Khallil

Abstract : In this paper, a numerical simulation of a finned store separating from a wing-pylon configuration has been studied and validated. A dynamic unstructured tetrahedral mesh approach is accomplished by using three grid sizes to numerically solving the discretized three dimensional, inviscid and compressible Navier-stokes equations. The method used for computations of separation of an external store assuming quasi-steady flow condition. Computations of quasi-steady flow have been directly coupled to a six degree-of-freedom (6DOF) rigid-body motion code to generate store trajectories. The pressure coefficients at four different angular cuts and time histories of various trajectory parameters during the store separation are compared for every grid size with published experimental data.

Keywords : CFD modelling, transonic store separation, quasi-steady flow, moving-body trajectories
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