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Aerodynamic Analysis of a Typical Missile in the Presence of Aircraft

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***Abstract*-- In this paper presented by predictions of separation moments off the external store weapons carried out on fighter aircraft wing under the Mach number subsonic to supersonic speed. An aerodynamically analysis of static steady condition for Navier-Stoke Equations condition applied on boundary conditions. After that analysis for flow field and shear force acting on stores outer surface area.**

Keywords*-- *Clipped wing, Pylons, Store, Mach number's, CFD, Flow Field Analysis.

I. INTRODUCTION

A fighter aircraft carries various types of stores such as drop tanks, missiles, and bombs, etc., In general way of launching the missile is very much difficult to control and achieve the accurate target. They are various kind of target achieve method are followed by ground launchers, shipboard and particularly from high speed parent aircraft is indeed a difficult and most challenging task. Careful design practice must be exercised in order to assure that the missile realizes clean and safe zone separation as well as minimum deviation from the intended flight path.

The aerodynamically analysis of flow in outer surface pressure and shear stress variation are changed for aerodynamic forces and moments. In this method, a modal of all or part of the parent aircraft wing and missile are placed in directions of free stream direction.

II. SCALING OF GEOMETRY

In this problem analysis of drawing are created by using drafting tool about Solid Works software package and its very much easy way to learn. The wing section were taken by clipped wing and ogive shape of store are located in mean aerodynamic center line of the wing.

An aerodynamically produced translational acceleration is inversely with the characteristic of the length of missile.

III. COMPUTATIONAL GRID GENERATION

Geometry modelling, cleaning and grid generation for Eular computation using ICEM.

IV. FLOW SOLUTION AND RESULT

The problem consider flow around wing and store. An analysis of co-efficient forces and co-efficient moment forces acting on store.

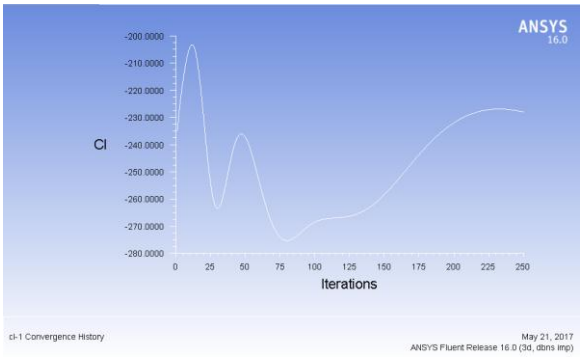

Fig: 1.1 C_L vs iterations at M = 0.8

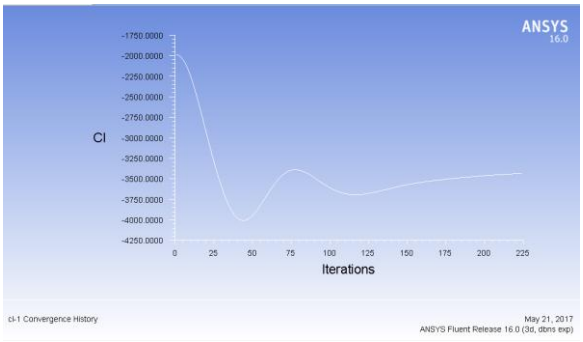

Fig: 1.2 C_L vs iterations at M = 1.2

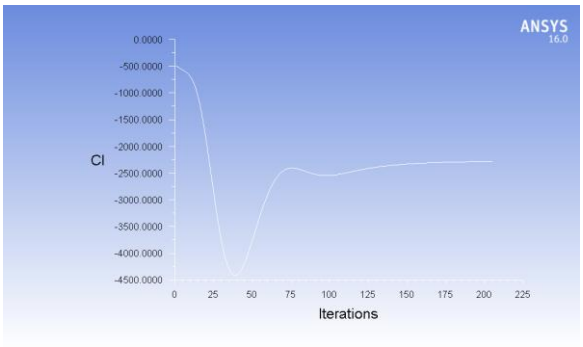

Fig: 1.3 C_L vs iterations at M = 1.4

In fluid flow at x-direction and parallel to the wing and store. The momentum of force acting on change in center of pressure and it rear or behind of center of gravity.

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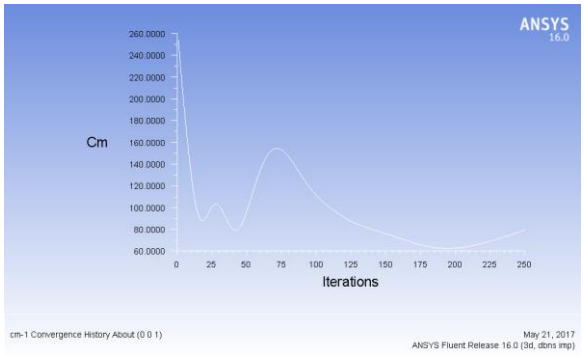

Fig: 1.4 C_M vs iterations at M = 0.8

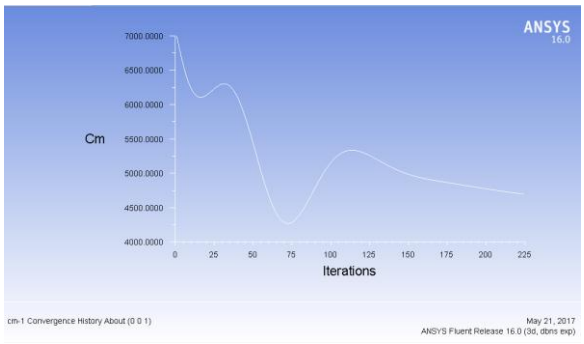

Fig: 1.5 C_M vs iterations at M = 1.2

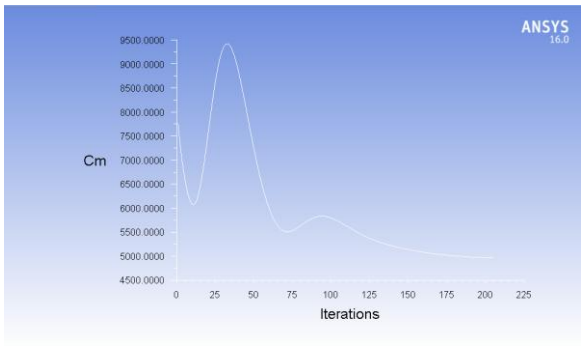

Fig: 1.6 C_M vs iterations at M = 1.4

V. CONCLUSION

In this analysis of store separation are consider of statically steady state condition. The fluid flow over the surface area of the store surface and coefficient of force, coefficient of moment force, shear force, pressure distribution, density variation.

VI. FUTURE WORK

The most difficulty of finding dynamically analysis of 6-DOF and fluid flow field analysis over the wing and store. After that initial time interval of store relies and what distance safe to activate store propulsion system without affecting parent aircraft.

VII. REFERENCE

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