点击复制

无人机机载导弹分离轨迹的数值仿真(PDF)

工具/TOOLS

引用本文的文章/References

下载 PDF/Download PDF(185KB)

立即打印本文/Print Now

统计/STATISTICS

摘要浏览/Viewed

全文下载/Downloads   538

评论/Comments   191

RSS XML

Title: Numerical Simulation of Trajectory of Missile Separated from UAV

作者: 沈 琼; 余雄庆

南京航空航天大学飞行器先进设计技术国防重点学科实验室，南京 210016

Author(s): SHEN Qiong; YU Xiongqing

Key Laboratory of Fundamental Science for National Defense‐Advance d Design Technology of Flight Vehicle, Nanjing University of Aeronautics and Astronautics, Nanjing 210016, C hina

关键词: 机载导弹; 飞机发射装置; 运动轨迹; 分离; 动态嵌套网格; 六自由度方程

Keywords: airborne missile; aircraft launching device; trajectory; moving c himera grid separation; six degree‐of‐freedom

分类号: TJ768;V279

DOI: -

文献标识码: A

摘要: 载机发射导弹时，对导弹流场有复杂干扰，进而影响导弹在发射初始阶段的姿态和运动轨迹。为模拟 导弹从载机分离后的气动特性和相对运动，文中应用CFD商用软件CFD‐FASTRAN，采用动态嵌套网格技 术，基于Euler方程并耦合该软件的刚体六自由度（6‐DOF）运动模块求解导弹发射时的非定常流场及运动轨 迹。分析挂架弹射力和载机迎角变化对分离过程运动参数的影响，发现挂架弹射力仅是加快了导弹的运动， 而迎角的变化对导弹运动参数有较大影响。研究结果对飞机上如何布置外挂导弹具有

Abstract: The low‐field is disturbed when a missile is launched fro m aircraft, which influences initial attitude and trajec‐tory of the launched missile. To simulate trajectory of the missile separated from aircraft, the CFD software named CFD‐FASTRAN was used to compute the unsteady flow‐field and the missile trajectory by using the moving chimera grid, Euler equations and six degree‐of‐freedom equation. The eff ect of launching force and angle of attack on the mis‐sile trajectory was presented, it is indicated that launching force just accelerates the movement of the missiles while the angle of attack change have a greater impact on movement paramet ers of the missile. The simulation results can provide guidance for the layout of missile in aircraft design.

参考文献/REFERENCES

[1] Lee C J, Getson E. IHAAA applications to reduc‐ing store separation flight testing [R].AIAA 2007 -1653.

[2] Harish G, Pavanakumar M.Store separation dy‐namics using grid‐free Euler solver [R].AIAA 2006-3650.

[3] Hall L H, Parthasarathy V. Validation of an auto‐mated Chimera/6‐DOF methodology for multiple moving body problems [R].AIAA 98-0753.

[4] 车竞, 唐硕, 谢长强. 空射导弹发射初始弹道数值 仿真 [J].空气动力学学报，2006，24（2）:214- 219.

［5 ］ 张震霖. 外挂物投放技术的数值方法研究 ［D ］.西 安: 西北工业大学，2004.

［6 ］ CFD‾FASTRAN THEORY MANUAL ［Z ］.Ver‾sion 2004， ESI CFD.Inc.

更新日期/Last Update: 2009-10-25