航空学报
ACTA AERONAUTICA ET ASTRONAUTICA SINICA
ISSN 1000-6893
CN 11-1929/V

航空学报 » 1983, Vol. 4 » Issue (1) :1-7 DOI:

机翼-副翼-调整片的非定常气动力和颤振计算

杨永年[1], 程景云[2]

1. 西北工业大学;2. 上海飞机设计研究所

UNSTEADY AERODYNAMIC FORCES AND FLUTTER ANALYSIS FOR A WING-AILERON-TAB CONFIGURATION

Yang Yongnian[1], Cheng Jingyun[2]

1. Northwestern Polytechnical University;2. Shanghai Aircraft Design and Research Institute

摘要 本文应用偶极子格网法对一个机翼-副翼-调整片颤振模型进行了三元非定常气动力和颤振计算,还研究了网格数目对结果收敛性的影响。计算结果表明本方法具有较好的收敛性,和试验结果相比较表明本方法有一定的工程精度,在飞机设计中能用于操纵面-调整片构型的非定常气动力和颤振计算。

关键词：

Abstract： In general,it is possible to extend the current linear lifting surface methods for calculating the unsteady aerodynamic forces on lifting surface to calculation of the wing-aileron-tab configuration.But owing to the limits of the methods and capacity and computational speed of the computer,it is often dif-fcult to predict accurately the unsteady aerodynamic forces on lifting surface with a control surface and a tab which covers a little portion of main surface.So far,there appears few of three-dimensional unsteady aerodynamic methods which can analyze the tab flutter satisfactorily.Also,it is rare to find successful numerical examples of three-dimensional aerodynamic forces and flutter for a wing-aileron-tab configuration.The residual downwash methods proposed by W.S.Rowe and others（4）,（5）can be used to calculate a wing-control surface configuration with discontinuous downwash distribution,but they are very complicated and need a huge amount of calculation.An analysis of unsteady aerodynamic forces and flutter for a wing-aileron-tab configuration by doublet-lattice method is presented in this paper.The six cases with box numbers 41,68,92,130,154 and 182 respectively have been calculated.In this range of box numbers the maximum variance of the flutter velocity and flutter frequency are 6.92% and 2.24% respectively.The difference between calculated and experimental flutter velocities is 18.8% to 24.4%.The results show that this method provides good convergence and accuracy enough for engineering.

Keywords：

Received 1982-03-13;

Service
把本文推荐给朋友
加入我的书架
加入引用管理器
Email Alert
RSS
作者相关文章

引用本文:

杨永年;程景云. 机翼-副翼-调整片的非定常气动力和颤振计算[J]. 航空学报, 1983, 4(1): 1-7.

Yang Yongnian;Cheng Jingyun. UNSTEADY AERODYNAMIC FORCES AND FLUTTER ANALYSIS FOR A WING-AILERON-TAB CONFIGURATION[J]. Acta Aeronautica et Astronautica Sinica, 1983, 4(1): 1-7.

Copyright 2010 by 航空学报