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论文

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### 计算飞行力学的产生和发展

关世义

中国海鹰机电技术研究院 北京 100074

### DEVELOPMENT OF COMPUTATIONAL FLIGHT MECHANICS

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摘要

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**摘要** 综述了计算飞行力学的产生背景、问题表述、理论框架和飞行力学的计算系统,以及计算飞行力学在未来飞行器研制和应用研究中的重要意义

**关键词:** 飞行器 飞行力学 计算飞行力学 计算机

**Abstract:** The background of the development, concept, problem description, theoretical framework of Computational Flight Mechanics (CFM) as a new branch of Flight Mechanics in the information era have been depicted in detail, in which the important roles of computer science and technology (such as the applications of software engineering, computer network, visualization, multi media, Expert Systems and so on), experiment design approach, numerical calculation method, modeling and simulation, flight environment, etc. are highlighted. Finally, some proposals for the software and hardware systems of CFM laboratory are provided from the view point of practical purpose. The following parts are included: (1) Introduction, in which it is pointed out that there are three major phases of the development of Flight Mechanics: Traditional Flight Mechanics, Auto Flight Mechanics and Computational Flight Mechanics.(2) Flight Mechanics and Computer, in which the important roles of advanced computer science and technology in flight mechanics research have been discussed, and the definition of CFM is given.(3) Problem description of CFM, in which a hierarchical structure of problem description for CFM is introduced.(4) Theoretical framework of CFM, in which the modeling theory and method, numerical calculation method and algorithm, experiment design method, and some associated computer technologies are discussed in detail.(5) Computation systems of CFM, in which some proposals for the software and hardware systems, and local area network are provided.

**Keywords:** flight vehicle flight mechanics computational flight mechanics computer

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