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机群协同空战中的指控系统建模与分析

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摘要 为对机群协同空战指挥控制系统性能进行分析，建立了树型机群指挥控制系统组织结构，并提出了性能评价指标。运用随机Petri网技术分别建立了有预警机指挥和无预警机指挥的机群协同空战指挥控制系统模型。仿真分析表明，基于预警机的机群指挥控制系统可减轻作战飞机的任务负担，且能充分发挥机载武器的超视距作战能力；也证明了随机Petri网技术能够分析指挥控制系统的性能缺陷和瓶颈，从而为系统的设计和改进提供有力的支撑，是描述机群协同空战指挥控制系统问题的一种有效方法。

关键词 机群协同空战 指挥控制 随机Petri网 建模

分类号

Modeling and analysis of command and control system in cooperative air combat

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Abstract

For analyzing the performance of command and control system in group-craft cooperative air combat，a tree structure of command and control system is built and evaluative indexes of performance are put forward.Two models of command and control system，one has airborne warning and control system and another has not，are respectively built based on stochastic Petri net.The simulation analysis shows that the command and control system based on airborne warning and control system can lighten the task burden of fighters and fully exert the capacity of beyond visual range air combat of weapons，and proves that stochastic Petri net can analyze the shortcoming and bottleneck and provide reference for system design and improvement.It is an effective analysis approach for describing command and control problem in group-craft cooperative air combat.

Key words group-craft cooperative air combat command and control stochastic Petri net modeling

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