



脉冲型逻辑切换飞行系统的制导控制律设计

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Guidance and control law design for an impulsive logic-based switching flight system

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摘要

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摘要 探讨了气动舵面和侧向喷流复合控制模式下拦截弹飞行系统的制导与控制. 由于高空气动升力不足, 同传统的只装配气动舵面的拦截弹相比, 为改进对于机动目标的拦截精度, 将侧向喷流装置引入以增加导弹的机动能力. 使用脉冲型混杂切换系统对侧向喷流导弹动力学进行描述; 滑模制导律和决定侧向喷流装置开启策略的逻辑切换律被提出用于产生期望制导指令. 仿真和比较证实: 滑模制导律和逻辑切换律对目标机动敏感, 末端脱靶量很小(<0.1 m), 拦截弹动能碰撞杀伤目标.

关键词: 切换系统 滑模 制导律 切换律 保性能控制

Abstract: Guidance and control law design for an interceptor equipped with both aero fins and side jets was discussed. Since the aerodynamic lift force for generating available norm load is not enough at high altitude, side jets are introduced into the interceptor dynamics to increase its maneuver capability for improving the interception precision to a maneuvering target by comparison with a traditional missile equipped with only aero fins. The side-jet missile dynamics was described with a hybrid impulsive switching system model. A sliding mode guidance law and a logic-based switching function for turning on the side jets were both proposed to generate desired guidance commands. Simulations and comparisons verify that the sliding mode guidance law and logic-based switching law are sensitive to target-s maneuvering and the end-game miss distance is smaller than 0.1m which represents the interceptor directly hits and kills the target.

Keywords: [switching systems](#) [sliding mode](#) [guidance law](#) [switching functions](#) [guaranteed cost control](#)

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