

## 军用系统分析

### 基于IMM-UKF方法的主动段目标分级与关机识别

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摘要:

主动段目标的分级与关机识别对于系统把握目标模型切换并部署后续跟踪具有重要意义。建立了主动段目标的分级和关机所涉及的两级主动段模型和中段模型; 引入了交互式多模型框架以应对不确定模式下的跟踪问题, 引入了无迹卡尔曼滤波以解决非线性估计问题。在天基观测条件下进行了仿真实验, 结果表明, 利用模型概率和总体估计误差的异常变化, 可有效识别主动段目标的分级和关机。

关键词: 主动段 分级与关机 加速度与速度之比 交互式多模模型 无迹卡尔曼滤波 天基观测

### Identification of staging and burnout for the boost phase object based on the IMM-UKF method

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Abstract:

The identification of staging and burnout for the boost phase object play an important role for the tracking system to determine the target's flight mode transition and deploy the subsequent tracking. First, the dual-stage boost phase kinematic model and the coast phase kinematic model which associate with the staging and burnout are derived. Second, the interacting multiple model framework is introduced to solve the target track problem with the structural uncertainty, and the unscented Kalman filter is used to figure out the nonlinear estimation problem. Finally, the simulation in the condition of space-based observations is conducted, which is shown that the staging and burnout can be efficiently identified via the abnormal change of the mode probability and the overall covariance.

Keywords: boost phase staging and burnout acceleration-to-speed ratio (ASR) interacting multiple model (IMM) unscented Kalman filter (UKF) space-based observations

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