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### 机动目标的多项式预测模型及其跟踪算法

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### Polynomial Prediction Model and Tracking Algorithm of Maneuver Target

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摘要

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**摘要** 根据匀变速运动的多项式描述形式, 利用多项式预测滤波器对目标状态建模, 提出了一种全新机动目标运动的动态模型——多项式预测模型, 并针对这个全新的模型给出了相应的最优滤波算法。分析表明: 该模型可以精确描述任意可以由多项式描述的目标运动, 而不需要已知运动的具体参数, 因此相应的最优滤波算法适用于任何可以用多项式描述的机动目标状态估计问题。一个机动目标跟踪问题的计算机仿真证明了本文方法的有效性和实用性。

**关键词:** 多项式预测 动态模型 机动目标跟踪 卡尔曼滤波 交互多模型

**Abstract:** Based on a constant acceleration motion law represented by a polynomial, this article proposes a novel dynamic model of maneuver target—polynomial prediction model (PPM) and its optimal filtering algorithm by means of modeling the target state by a polynomial prediction filter. The analytical results show that any target motion represented by the polynomials can be modeled by this PPM since it does not require any prior knowledge of the target dynamics, and that the optimal filtering algorithm corresponding to it can track any maneuvering motion of a target. The simulation results of the maneuvering target tracking verify the effectiveness of the proposed model and algorithm.

**Keywords:** polynomial prediction dynamic models maneuvering target tracking Kalman filter interacting multiple model

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