



航空学报 » 1983, Vol. 4 » Issue (1) :62-72 DOI:

论文

[最新目录](#) | [下期目录](#) | [过刊浏览](#) | [高级检索](#)

[<<](#) [<](#) [<< 前一页](#) | [后一页 >>](#) [>>](#)

应用卡尔曼滤波的机载雷达跟踪系统

毛士艺

北京航空学院

AIRBORNE RADAR TRACKING SYSTEM BASED ON OPTIMAL FILTERING THEORY

Mao Shi-yi

Beijing Institute of Aeronautics and Astronautics

摘要

参考文献

相关文章

Download: [PDF \(588KB\)](#) [HTML \(0KB\)](#) Export: [BibTeX](#) or [EndNote \(RIS\)](#) [Supporting Info](#)

**摘要** 本文论述将滤波理论应用于机载雷达中对单个目标进行距离、速度、方位角和高低角跟踪的多环反馈系统。首先根据目标和天线的相对运动建立控制四坐标跟踪环所需的状态矢量微分方程,然后推导相应的非线性滤波算法。最后给出计算机的模拟结果。计算机模拟的结果清晰地说明采用最佳滤波的系统性能比通常的有很大改善,并且这种瞄准轴坐标的最佳系统对目标的随机机动是不灵敏的。本文所讨论的方法和得出的结论可以延用到地面雷达、舰载雷达以及其他有源和无源的跟踪系统。

**关键词:**

**Abstract:** In this paper, a filtering theory is applied to the multiple closed-loop feedback system for tracking a single target in range, velocity, azimuth and elevation in an airborne radar. First of all, according to relative motion between target and antenna, the vector differential equation of the states used to control the four tracking loop is established. Then, the corresponding nonlinear filtering algorithm is derived. Finally, the results of computer simulation are given. The results of computer simulation show that in a wide range the time varying system using Kalman filter can keep better performance than the ordinary one without optimal filter. The system involving nonlinear filtering has a performance closed to the linear filtering one in steady-state response, but the former achieves performance improvement in transient response and in large error. Using Kalman filter, the tracking loops are coupled each other, and its performance is better than that of separate loops. Finally, we show that a particular merit of this mathematical model, established in aim coordinate system, is less sensitive to target's manoeuvre. Therefore, the system performance is almost as good as an adaptive estimator, but which is sensitive to measurement noise. As the signal to noise ratio of radar varies in a wide range, we should take adaptive method in measuring noise. The technique used and results obtained are also available for ground radar, shipborne radar and other tracking systems, either active or passive.

**Keywords:**

Received 1981-10-01;

引用本文:

毛士艺. 应用卡尔曼滤波的机载雷达跟踪系统[J]. 航空学报, 1983, 4(1): 62-72.

Mao Shi-yi. AIRBORNE RADAR TRACKING SYSTEM BASED ON OPTIMAL FILTERING THEORY[J]. Acta Aeronautica et Astronautica Sinica, 1983, 4(1): 62-72.

Service

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [Email Alert](#)
- ▶ [RSS](#)

[作者相关文章](#)